Model 1

Answer the following questions :

1 Complete the following :

1. The S.S. of the equation : $(x^2 + 3)(x^3 + 1) = 0$ is .... , $x \in \mathbb{R}$
2. If the lower boundary of a set is 10 and the upper boundary is x and its centre is 15 , then $x =$ ....
3. $]-2 , 2] \cup \{-2 , 0\} =$ ....
4. The cube whose volume is 8 cm^3 , then the sum of all its edge lengths = ... cm.
5. The multiplicative inverse of the number $(\sqrt{3} + \sqrt{2})$ is .... in the simplest form.

2 Choose the correct answer from the given ones :

1. If the radius length of a sphere is 6 cm. , then its volume is ....

   (a) 6π cm^3 (b) 36π cm^3 (c) 72π cm^3 (d) 288π cm^3

2. If the point (a , 1) satisfies the relation $x + y = 5$, then a = ...

   (a) 1 (b) – 4 (c) 4 (d) 5

3. $(2\sqrt[3]{2})^3 =$ ....

   (a) 4 (b) 8 (c) 16 (d) 40

4. The median of the values : 34 , 23 , 25 , 40 , 22 , 4 is ....

   (a) 22 (b) 23 (c) 24 (d) 25

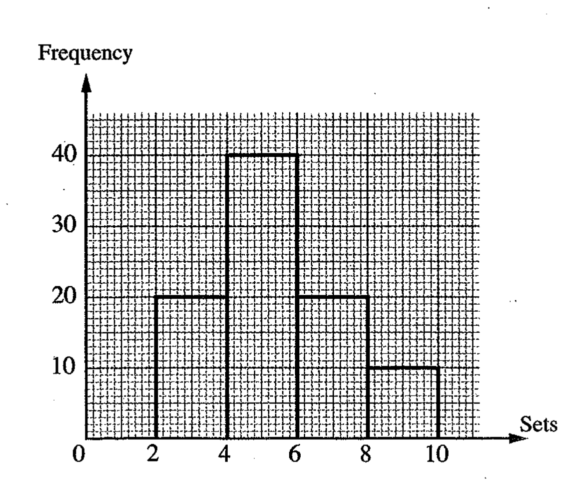
5. If the arithmetic mean of the values : 27 , 8 , 16 , 24 , 6 , k is 14 , then k = ...

   (a) 3 (b) 6 (c) 27 (d) 84

6. **In the opposite figure :**

   The value of the mode = ...

   (a) 4 (b) 5
   (c) 6 (d) 40



3 **[a] Find the value of :** $\sqrt{18} + \sqrt[3]{54} - 3\sqrt{2} - \frac{1}{2}\sqrt[3]{16}$

[b] If $X = \frac{3}{\sqrt{5} - \sqrt{2}}$ and $y = \sqrt{5} - \sqrt{2}$

, **prove that :** X and y are two conjugate numbers.

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4 **[a]** The area of a square is 1089 cm^2. Find the length of its diagonal.

[b] Find the S.S. of the inequality : $\frac{3X + 1}{6} < X + 1 < \frac{X + 4}{2}$ in $\mathbb{R}$

, then represent it on the number line.

---

5 **[a]** The radius length of the base of a right circular cylinder is $4\sqrt{2}$ cm. and its height is 9 cm. Find its volume in terms of π and if its volume equals the volume of a sphere , find the radius length of the sphere.

[b] Find the arithmetic mean of the following frequency distribution :

The sets	5 –	15 –	25 –	35 –	45 –	Total
Frequency	7	10	12	13	8	50

Model 2

Answer the following questions :

1 **Complete the following :**

1. The additive inverse of the number : $-\sqrt{3} - \sqrt{5}$ is ....
2. $(\sqrt{8} + \sqrt{2})(\sqrt{8} - \sqrt{2}) =$ ....
3. The conjugate of the number $\frac{2\sqrt{5} - 3\sqrt{2}}{\sqrt{2}}$ is ....
4. If the volume of a sphere is $\frac{9}{2}\pi$ cm^3 , then its diameter length is .... cm.
5. $[3 , 4] - \{3 , 5\} =$ ....

---

2 **Choose the correct answer from the given ones :**

1. If the volume of a cube is 27 cm^3 , then the area of one of its faces is ....
   (a) 3 cm^2 (b) 9 cm^2 (c) 36 cm^2 (d) 54 cm^2
2. If the mode of the values 4 , 11 , 8 , 2 X is 4 , then $X =$ ....
   (a) 2 (b) 4 (c) 6 (d) 8



3 If the arithmetic mean of the values 18 , 23 , 29 , $2k-1$, k is 18 , then k = ...

(a) 1 (b) 7 (c) 29 (d) 90

4 If the lower limit of a set is 4 and the upper limit is 8 , then its centre is ....

(a) 2 (b) 4 (c) 6 (d) 8

5 A right circular cylinder the radius length of its base is r cm. and its height equals its diameter length , then its volume = ... cm^3

(a) πr^3 (b) πr^2 (c) $2\pi r^3$ (d) $2 r^3$

6 The solution set of the equation : $x(x^2-1)=0$, $x \in \mathbb{R}$ is ....

(a) {0} (b) {1} (c) {– 1} (d) {0 , – 1 , 1}

3 [a] **Reduce to the simplest form :** $\frac{\sqrt{3}}{\sqrt{5}-\sqrt{3}}+\frac{\sqrt{5}}{\sqrt{5}+\sqrt{3}}$

[b] **Prove that :** $\sqrt[3]{128}+\sqrt[3]{16}-2\sqrt[3]{54}=0$

4 [a] **Find the S.S. of the inequality :** $-2<3x+7\le 10$ in $\mathbb{R}$, then represent the interval of solution on the number line.

[b] If $x=\sqrt{2+\sqrt{3}}$, **find the value of :** x^4-2x^2+1

5 [a] The opposite graph represents the marks of 32 pupils in an exam.

Complete :

The median mark = ...

Frequency
32 28 24 20 16 12 8 4
0 5 10 15 20 25 30 Sets

[b] **Find the arithmetic mean of the following frequency distribution :**

The sets	5 –	15 –	25 –	35 –	45 –	Total
Frequency	4	5	6	3	2	20



Model for the merge students

Answer the following questions :

1 Complete each of the following :

1. The conjugate of the number $\sqrt{3}+\sqrt{2}$ is ....
2. $\sqrt{18}+\sqrt{54}-3\sqrt{2}=$ ....
3. The mode for the numbers : 3 , 5 , 3 , 4 , 3 is ....
4. The median of the values : 2 , 3 , 5 , 7 , 9 is ....
5. The solution set of the equation : $x^2+9=0$ in $\mathbb{R}$ is ....

2 Choose the correct answer from those given :

1. The arithmetic mean for the values : 9 , 6 , 5 , 14 , 1 is ....
   (a) 7 (b) 3 (c) 5 (d) 9
2. The simplest form of the expression : $(\sqrt{3}-\sqrt{2})(\sqrt{3}+\sqrt{2})$ is ....
   (a) $\sqrt{3}$ (b) 1 (c) $\sqrt{2}$ (d) $2\sqrt{3}$
3. The additive inverse of the number $-\sqrt{5}$ is ....
   (a) $\sqrt{5}$ (b) 5 (c) $\sqrt{2}$ (d) -5
4. $[3 , 5]-\{3 , 5\}=$ ....
   (a) $]3 , 5[$ (b) $[3 , 5[$ (c) $\varnothing$ (d) $]3 , 5]$
5. A cube is of volume 64 cm^3 , then its edge length is .... cm.
   (a) 4 (b) 8 (c) 16 (d) 64

3 Match from the column (A) to the suitable one from the column (B) :

(A)	(B)
1. The S.S. of the equation : $x^2-25=0$ in $\mathbb{R}$ is	$[0 , 2]$
2. $[-3 , 2]\cap[0 , 2]=$	7
3. If the order of the median is fourth , then the number of values is	$\{5 , -5\}$
4. $\sqrt{3}$ is a .... number.	(number line with closed dots at 3 and 7, segment between them)
5. The S.S. of the inequality : $3\le x\le 7$ on the number line is	irrational



4 **Put (✔) for the correct statements and (✘) for the incorrect ones :**

1. The arithmetic mean of a set of values = sum of values ÷ its number. ( )
2. If $X = \sqrt{13} - \sqrt{7}$, $y = \sqrt{13} + \sqrt{7}$, then X , y are two conjugate numbers. ( )
3. The irrational number $\sqrt{7}$ lies between 2 and 3 ( )
4. $\sqrt{75} - 2\sqrt{27} = 7\sqrt{3}$ ( )
5. The simplest form of the number $\frac{1}{\sqrt{5}}$ is $\frac{\sqrt{5}}{5}$ ( )

5 [a] **Complete :** If the lower limit of a set is 4 and the upper limit is 8

, then its centre = $\frac{\dots\dots\dots + \dots\dots\dots}{2}$ = ...

[b] **Complete the following table to obtain the arithmetic mean of the following frequency distribution :**

Sets	5 –	15 –	25 –	35 –	45 –	**Total**
Frequency	7	10	12	13	8	**50**

Sets	**The centre of the set « X »**	**Frequency « f »**	$X \times$ **f**
5 –	10	7	10 × 7 = 70
15 –	20	10	20 × 10 = ...
25 –	....	....	.... × 12 = ...
35 –	....	....	.... × 13 = ...
45 –	....	....	.... × 8 = ...
Total		50	....

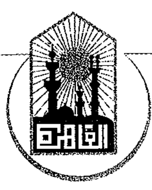
The arithmetic mean = $\frac{\Sigma (X \times f)}{\Sigma (f)} = \frac{\dots\dots\dots}{\dots\dots\dots}$ = ...





1 Cairo Governorate

Nasr City Educ. Administration
St. Fatima Language School



Answer the following questions :

1 Choose the correct answer :

1 $[0, 5] \cup [3, 8[=$ ....

(a) $]3, 5]$ (b) $[3, 5]$ (c) $[0, 8]$ (d) $[0, 8[$

2 $\sqrt{12} - \sqrt{3} =$ ....

(a) 3 (b) $\sqrt{3}$ (c) $2\sqrt{3}$ (d) $3\sqrt{3}$

3 The S.S. in $\mathbb{R}$ of the equation $x(x^2 - 1) = 0$ is ....

(a) $\{0\}$ (b) $\{1\}$ (c) $\{-1\}$ (d) $\{0, -1, 1\}$

4 The arithmetic mean of the values 27, 8, 16, 24, 6, k is 14, then k = ...

(a) 3 (b) 6 (c) 27 (d) 84

5 The additive inverse of the number $-\sqrt{5}$ is ....

(a) $\sqrt{5}$ (b) 5 (c) $\sqrt{2}$ (d) -5

6 The radius length of a sphere is 6 cm., then its volume is ....

(a) 6π cm³ (b) 36π cm³ (c) 72π cm³ (d) 288π cm³

2 Complete :

1 $[1, 5] \cap]-2, 3] =$ ....

2 The mode of the set of the values 3, 4, 7, 4, 2 is ....

3 The volume of the cuboid whose dimensions are $\sqrt{2}, \sqrt{3}, \sqrt{6}$ cm. is .... cm³

4 The S.S. in $\mathbb{R}$ of $3 < 2x - 1 < 5$ as an interval is ....

5 The slope of any line parallel to x-axis is ....

3 [a] If $a = \sqrt{3} + \sqrt{2}$, $b = \sqrt{3} - \sqrt{2}$, **find the value of :** $a^2 - ab + b^2$

[b] Find the S.S. for each of the following inequalities in $\mathbb{R}$, in the form of an interval, then represent the S.S. on the number line :

1 $5x - 3 < 2x + 9$ 2 $1 \le 3 - 2x < 5$

4 [a] If $M = [2, \infty[$, $J =]-2, 3[$, **find each of the following using the number line :**

1 $M \cap J$ 2 $M - J$

[b] Simplify : $\frac{\sqrt{3}}{\sqrt{5} - \sqrt{3}} + \frac{\sqrt{5}}{\sqrt{5} + \sqrt{3}}$

5 **[a] Reduce to the simplest form :** $2\sqrt{18} + \sqrt{50} + \frac{1}{3}\sqrt{162}$

[b] Find the arithmetic mean of the following frequency distribution :

The Set	5 –	15 –	25 –	35 –	45 –	Total
Frequency	4	5	6	3	2	20

2 Cairo Governorate

El-Maadi Zone
Directing Mathematics



Answer the following questions :

1 **Choose the correct answer :**

1. The multiplicative inverse of $\frac{\sqrt{3}}{12}$ is ....
   (a) $4\sqrt{3}$ (b) 2 (c) $2\sqrt{3}$ (d) $6\sqrt{3}$
2. The conjugate of the number $2 - \sqrt{3}$ is ....
   (a) $\sqrt{3} - 2$ (b) $2 - \sqrt{3}$ (c) $\sqrt{2} - 3$ (d) $2 + \sqrt{3}$
3. The volume of the cuboid whose dimensions are $\sqrt{8}$, $\sqrt{3}$, $\sqrt{6}$ is ....
   (a) 144 (b) 12 (c) $\sqrt{120}$ (d) 20
4. The median for the values 7 , 8 , 9 , 6 and 5 is ....
   (a) 7 (b) 8 (c) 9 (d) 10
5. $4^3 + 4^3 + 4^3 + 4^3 =$ ....
   (a) 4^{20} (b) 4^4 (c) 4^{12} (d) 16^3
6. If (2 k , k) satisfies the relation $2x + y = 15$, then k = ...
   (a) 1 (b) 2 (c) 3 (d) 4

2 **Complete :**

1. $[2 , 7] -]2 , 7[=$ ....
2. If the mode of the values 8 , 11 , 4 , $2x$ is 4 , then $x =$ ....
3. $\mathbb{R} \cap \mathbb{R}_- =$ ....
4. The slope of the straight line passing through the two points A (5 , 3) , B (2 , 1) is ....
5. The solution set in $\mathbb{R}$ for $x^2 + 4 = 16$ is ....

3 **[a] Put in the simplest form :** $2\sqrt{8} + \sqrt{50} - \sqrt{32}$

[b] Find the solution set in $\mathbb{R}$ for : $3x - 4 \leq 5$ and represent it on the number line.

4 [a] If $X = \frac{2}{\sqrt{7}-\sqrt{5}}$, $y = \sqrt{7}-\sqrt{5}$, **find :** $(X + y)^2$

[b] Represent graphically the relation : $y = 3X - 2$

5 [a] If the volume of a sphere equals $\frac{500}{3}\pi$ cm^3 , find the length of its radius.

[b] The following table shows the frequency of marks of 50 students :

Sets	5 –	15 –	25 –	35 –	45 –	**Total**
Frequency	7	10	12	13	8	**50**

Find the mean of the marks of the students.



3 Cairo Governorate

El-Khalifa and El-Mokatam Zone
El-Helmia Exper. Lang. School



Answer the following questions :

1 **Choose the correct answer :**

1 The S.S. in $\mathbb{R}$ for the equation : $X^3 + 8 = 0$ is ....

(a) $\{4\}$ (b) $\{2\}$ (c) $\varnothing$ (d) $\{-2\}$

2 If the mode of the values 3 , 5 , $X + 1$, 5 , 3 , 1 is 5 , then $X =$ ....

(a) 5 (b) 4 (c) 3 (d) 6

3 The cube whose volume is 8 cm^3 , the area of one of its faces is .... cm^2

(a) 4 (b) 8 (c) 16 (d) 64

4 If $X < \sqrt{15} < X + 1$, $X \in \mathbb{Z}$, then $X =$ ....

(a) 3 (b) 4 (c) 5 (d) $\varnothing$

5 $\sqrt{3} + \sqrt{3} =$ ....

(a) -3 (b) $\sqrt{12}$ (c) 12 (d) 3

6 Which of the following ordered pairs satisfies the relation $2X + y = 5$?

(a) $(-1 , 3)$ (b) $(1 , 3)$ (c) $(3 , 1)$ (d) $(2 , 2)$

2 **Complete :**

1 $\sqrt[3]{\text{..............}} = -\sqrt{9}$

2 If $(-1 , 5)$ satisfies the relation $3X + ky = 7$, then k = ...

3 If the order of the median of some values is fifth , then the number of these values is ....

4 $[-2 , 5] \cap [3 , 7] =$ ....

5 If the lower limit of a set is 4 and the upper limit of the same set is 10 , then the centre of this set is ....



3 [a] The volume of a sphere is $562.5\,\pi$ cm³ , find its surface area.

[b] If $x = \frac{4}{\sqrt{7}+\sqrt{3}}$, $y = \sqrt{7}+\sqrt{3}$, **then find the numerical value of :** $x^2 - 2xy + y^2$

4 [a] **Find in $\mathbb{R}$ the S.S. of :** $-1 < 3x + 5 \le 14$ and represent it on the number line.

[b] **Graph the relation :** $2x + y = 1$

[c] If $A =]-\infty , 3[$, $B = [-1 , 5]$

, **find the following using the number line :** 1 $A \cap B$ 2 $A - B$

5 [a] Find the slope of $\overleftrightarrow{AB}$ where A (– 1 , 3) , B (2 , 5)

Is the point C (8 , 1) $\in \overleftrightarrow{AB}$?

[b] **The following table shows the marks of 50 students in an examination :**

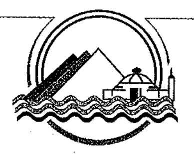
Sets	5 –	15 –	25 –	35 –	45 –	**Total**
Frequency	7	10	12	13	8	**50**

Find the arithmetic mean of this frequency distribution.



4 Giza Governorate

El-Haram Directorate
Al Maarefa Exp. Language School



Answer the following questions :

1 Complete the following :

1 $\sqrt{4} = \sqrt[3]{\ldots\ldots\ldots\ldots}$

2 $]-3 , 4[\cup \{-3\} = \ldots\ldots\ldots\ldots$

3 The mode of the values 7 , 3 , 8 , 2 , 3 , 4 , 3 , 7 is ....

4 If (3 k , 2 k) satisfies the relation $2x - y + 2 = 12$, then k = ...

5 The slope of the straight line which passes through A (2 , – 5) , B (3 , – 2) is ....

2 Choose the correct answer :

1 The multiplicative inverse of $\frac{\sqrt{2}}{4}$ is ....

(a) $\sqrt{2}$ (b) $2\sqrt{2}$ (c) $4\sqrt{2}$ (d) 2

2 $[2 , 5] -]2 , 5[= \ldots\ldots\ldots\ldots$

(a) $\{2 , 5\}$ (b) $[2 , 5[$ (c) $]2 , 5]$ (d) $\varnothing$

3 The mean of the values 4 , 7 , 3 , 9 , 2 is ....

(a) 2 (b) 3 (c) 5 (d) 7

4 The S.S. of the equation $x^2 + 36 = 0$ in $\mathbb{R}$ is ....

(a) $\{6\}$ (b) $\{-6\}$ (c) $\{6 , -6\}$ (d) $\varnothing$

5 If $5x = 35$, then $2x + 1 = \dots\dots$

(a) 9 (b) 15 (c) 8 (d) 7

6 The order of the median of 5 , 2 , 3 , 9 , 7 , 1 , 6 is ……………

(a) 9 (b) 5 (c) 4 (d) 2

3 [a] If $X = [-2, 4]$, $Y =]1, 6]$

, **find by using the number line :** 1 $\acute{X}$ 2 $X \cap Y$ 3 $X - Y$

[b] **Find in $\mathbb{R}$ the S.S. of the inequality :** $2x + 1 < 7$

4 [a] **Find in the simplest form :** $2\sqrt{18} + \sqrt{50} - \sqrt{162}$

[b] If $x = 3 + \sqrt{5}$, $y = \frac{4}{3 + \sqrt{5}}$

, **prove that :** x , y are conjugate numbers **and find the value of :** $x^2 - 2xy + y^2$

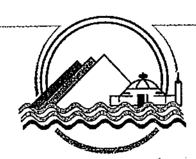
5 [a] A lead cuboid in which its dimensions are 77 cm. , 24 cm. and 21 cm. It was melted to form a sphere. Find the radius length of that sphere $\left(\pi = \frac{22}{7}\right)$

[b] **Find the median by using the ascending cumulative frequency curve :**

Sets	5 –	15 –	25 –	35 –	45 –	**Total**
Frequency	4	5	6	3	2	**20**

5 Giza Governorate

Abo El-Nomros Educational Zone
Royal House Language Schools



Answer the following questions :

1 **Choose the correct answer :**

1 $\left(\sqrt{8} + \sqrt{2}\right)^2 = \dots\dots$

(a) $\sqrt{10}$ (b) 10 (c) 18 (d) $\sqrt{18}$

2 The slope of any line // x-axis is ……………

(a) 1 (b) undefined (c) – 1 (d) zero

3 The multiplicative inverse of $\left(-2\frac{1}{3}\right)$ is ……………

(a) $\frac{1}{3}$ (b) $-\frac{7}{3}$ (c) $\frac{3}{7}$ (d) $-\frac{3}{7}$

4 The median of the values 34 , 23 , 25 , 40 , 22 is ……………

(a) 22 (b) 23 (c) 24 (d) 25

5 $2a^2b \times \dots\dots = 12a^3b$

(a) 6 a b (b) 6 a (c) 6 b (d) $6ab^2$



6 The mode of the values 8 , 5 , $x + 3$, 5 , 8 is 8 , then $x =$ ....

(a) 5 (b) 8 (c) 3 (d) – 5

2 Complete :

1 The point (3 , ...) satisfies $2x + y = 10$

2 The mean of x , $2x$, $3x$ is ....

3 If $2x = y$, then $x : y =$ .... : ....

4 If the centre of a set is 4 and the upper limit of this set is 8 , then the lower limit of this set is ....

5 $[2 , 3] - \{2 , 3\} =$ ....

3 [a] If $x = \sqrt{7} - \sqrt{6}$, $y = \frac{1}{x}$, **find the value of :** $(x + y)^2$ (Show the steps).

[b] **Find in $\mathbb{R}$ the S.S. of :** $-15 \leq 2x - 3 \leq 5$

[c] **Simplify :** $\sqrt[3]{54} + 8\sqrt[3]{\frac{1}{4}} + 5\sqrt[3]{16}$

4 [a] If $X =]-\infty , 5]$ and $Y =]1 , 9[$, **find by using the number line :**

1 $X \cap Y$ 2 $X \cup Y$ 3 $X - Y$

[b] Find the slope of the straight line passing through the two points (2 , 4) , (4 , 5)

5 [a] **Find the S.S. in $\mathbb{R}$:** $125x^3 - 7 = 20$

[b] **Find the mode of the following distribution :**

The Set	2 –	6 –	10 –	14 –	18 –	22 –	26 –	Total
Frequency	3	5	8	10	7	5	2	40

6 Alexandria Governorate

East Educational Zone
Maths Supervision



Answer the following questions :

1 Choose the correct answer from the given ones :

1 The arithmetic mean for the values : 9 , 6 , 5 , 14 , 1 is ....

(a) 7 (b) 3 (c) 5 (d) 9

2 The additive inverse of the number $-\sqrt{5}$ is ....

(a) $\sqrt{5}$ (b) 5 (c) $\sqrt{2}$ (d) – 5

3 If the lower limit of a set is 4 and the upper limit is 8 , then its centre is ....

(a) 2 (b) 4 (c) 6 (d) 8

4 The simplest form of the expression : $(\sqrt{3}-\sqrt{2})(\sqrt{3}+\sqrt{2})$ is ....

(a) $\sqrt{3}$ (b) 1 (c) $\sqrt{2}$ (d) $2\sqrt{3}$

5 If the radius length of a sphere is 6 cm. , then its volume is .... π cm^3

(a) 6 (b) 36 (c) 72 (d) 288

6 $(2\sqrt[3]{2})^3$ = ...

(a) 4 (b) 8 (c) 16 (d) 40

2 Complete the following :

1 If $3^x = 1$, then x = ...

2 The median of the values 2 , 9 , 3 , 7 , 5 is ....

3 $]-2 , 2] \cup \{-2 , 0\}$ = ...

4 The mode for the numbers : 3 , 5 , 3 , 4 , 3 is ....

5 A cube whose volume is 8 cm^3 , then the sum of lengths of all its edges is ....

3 [a] Find the value of : $\sqrt{18}+\sqrt[3]{54}-3\sqrt{2}-\frac{1}{2}\sqrt[3]{16}$ (with steps).

[b] Represent graphically the relation : $y = 2 - x$

4 [a] Find the S.S. of the inequality : $-2 < 3x + 7 \le 10$ in $\mathbb{R}$, then represent the interval of solution on the number line.

[b] Reduce to the simplest form : $\frac{\sqrt{3}}{\sqrt{5}-\sqrt{3}}+\frac{\sqrt{5}}{\sqrt{5}+\sqrt{3}}$ (with steps).

5 [a] If $(\sqrt{3})^x = (2\sqrt{2}-\sqrt{5})(2\sqrt{2}+\sqrt{5})$, then what is the value of x ?

[b] Find the arithmetic mean of the following frequency distribution :

The Sets	5 –	15 –	25 –	35 –	45 –	Total
Frequency	7	10	12	13	8	50

7 Alexandria Governorate

El-Montazah Educational Zone
Math's Supervision



Answer the following questions :

1 Choose the correct answer :

1 $\frac{3}{4}$ = ... %

(a) 70 (b) 50 (c) 75 (d) 25



2 $[2, 7] -]2, 7[=$ ....

(a) $]2, 7]$ (b) $[2, 7[$ (c) $\{2, 7\}$ (d) $[2, \infty[$

3 The median of the values 3, 7, 2, 9, 5, 11 is ....

(a) 9 (b) 6 (c) 8 (d) 11

4 The remainder of subtracting $-5x$ from $3x$ equals ....

(a) $-2x$ (b) $8x$ (c) $2x$ (d) $8x^2$

5 If (a, 4) satisfies the relation $x - y = -1$, then the value of a is ....

(a) $\sqrt{3}$ (b) 5 (c) 27 (d) 3

6 If the lower limit of a set is 4 and its centre is 9, then its upper limit is ....

(a) 36 (b) 5 (c) 13 (d) 14

2 Complete :

1 $\sqrt[3]{5} +$ .... = zero

2 $\mathbb{R}^+ \cup \mathbb{R}^- =$ ....

3 $\sqrt{a} + \sqrt{b}$ its conjugate is .... and their sum is ....

4 The mode of the set of values 4, 5, k + 1, 3 is 3, then k = ...

5 The slope of the straight line parallel to x-axis equals ....

3 [a] Simplify :

1 $\sqrt{32} - \sqrt{50} + 4\sqrt{\frac{1}{2}}$ 2 $\sqrt[3]{16} - \frac{1}{3}\sqrt[3]{54}$

[b] If $x = \sqrt{7} + \sqrt{5}$, $y = \frac{2}{x}$, find the value of $\frac{x + y}{x y}$ in the simplest form.

4 [a] Find in $\mathbb{R}$ the S.S. of the following inequality : $-1 \leq 3 - 2x < 5$,

then represent the interval of solution on the number line.

[b] Find the height of a right circular cylinder whose height is equal to its base radius length and its volume is 72π cm³.

[c] Graph the relation : $x + 2y = 3$

5 [a] Find the slope of $\overleftrightarrow{AB}$, where A (– 1, 3) and B (2, 5). Is the point C (8, 1) $\in \overleftrightarrow{AB}$?

[b] Find the mean of the following frequency data :

Sets	8 –	12 –	16 –	20 –	24 –	Total
Frequency	4	10	16	12	8	50

8 El-Kalyoubia Governorate

Directorate of Education
Inspection of Mathematics



Answer the following questions :

1 Choose the correct answer :

1. Let A (3 , 5) and B (5 , – 1) , then the slope of $\overleftrightarrow{AB}$ = ...
   (a) $-\frac{1}{3}$ (b) – 3 (c) 3 (d) $\frac{1}{3}$
2. If the point (a , 1) satisfies the relation $x + y = 5$, then a = ...
   (a) 1 (b) – 4 (c) 4 (d) 5
3. The median of the values 34 , 23 , 25 , 40 , 22 , 4 is ....
   (a) 22 (b) 23 (c) 24 (d) 25
4. If the mode of the set of values 4 , 11 , 8 , 2 x is 4 , then x = ...
   (a) 2 (b) 4 (c) 6 (d) 8
5. The arithmetic mean for the values 9 , 6 , 5 , 14 , 1 is ....
   (a) 7 (b) 3 (c) 5 (d) 9
6. The mode for the values 3 , 5 , 3 , 4 , 3 is ....
   (a) 3 (b) 4 (c) 5 (d) 12

2 Complete :

1. 25% = ... (in the form of $\frac{a}{b}$ in the simplest form)
2. The sum of the two square roots of the number $2\frac{1}{4}$ is ....
3. $|-0.75|$ = ...
4. $\sqrt[3]{-125}$ = ...
5. The multiplicative inverse for $(\sqrt{3}+\sqrt{2})$ in its simplest form is ....

3

[a] Find the value of x if : $x^3 - 1000 = 0$

[b] Find the circumference of the circle whose area is 3π cm².

4

[a] Find : $[2 , \infty[\cap]-2 , 3[$ (by using the number line)

[b] Simplify the following to the simplest form : $(\sqrt{2}+5)(3+\sqrt{2})$

5

[a] Graph the straight line that represents the relation : $x + 2y = 3$

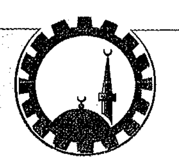
[b] Find the arithmetic mean of the following frequency distribution :

The Set	5 –	15 –	25 –	35 –	45 –	Total
Frequency	4	5	6	3	2	20



9 El-Gharbia Governorate

Central Mathematics Supervision
Official Languages Schools



Answer the following questions :

1 Choose the correct answer :

1. If the radius length of a sphere is 6 cm. , then its volume is ....
   (a) 6π cm^3 (b) 36π cm^3 (c) 72π cm^3 (d) 288π cm^3
2. If the point (a , 1) satisfies the relation $x + y = 5$, then a = ...
   (a) 1 (b) – 4 (c) 4 (d) 5
3. The median of the values 34 , 23 , 25 , 40 , 22 , 4 is ....
   (a) 22 (b) 23 (c) 24 (d) 25
4. The solution set of the equation $x(x^2 - 1) = 0$, $x \in \mathbb{R}$ is ....
   (a) $\{1\}$ (b) $\{0\}$ (c) $\{-1\}$ (d) $\{0 , 1 , -1\}$
5. If the arithmetic mean of the values 18 , 21 , 29 , 2 k + 1 , k is 18 , then k = ...
   (a) 1 (b) 7 (c) 29 (d) 90
6. $\sqrt{3\frac{3}{8}} = \frac{3}{2}\sqrt{\frac{\cdots\cdots}{\cdots\cdots}}$
   (a) $\frac{3}{8}$ (b) $\frac{3}{2}$ (c) $\frac{27}{8}$ (d) $\frac{729}{64}$

2 Complete the following :

1. If the lower boundary of a set is 10 and the upper boundary is x and its centre is 15 , then x = ...
2. The multiplicative inverse of the number $(\sqrt{3} + \sqrt{2})$ is .... (in the simplest form).
3. $[3 , 4] - \{3 , 5\} =$ ....
4. $\sqrt{64} - \sqrt[3]{64} =$ ....
5. The slope of the straight line passing through (2 , 3) and (5 , – 1) is ....

3

[a] If $x = \sqrt{7} + \sqrt{5}$, $y = \frac{2}{\sqrt{7} + \sqrt{5}}$

1. **Prove that :** x and y are two conjugate numbers.
2. **Find :** xy , $(x + y)^2$

[b] Find in the simplest form : $\sqrt{12} + \sqrt[3]{54} - \sqrt{3} - \sqrt[3]{16}$

4

[a] Graph the relation : $2x + 3y = 6$, if the straight line representing this relation intersects the x-axis at A and the y-axis at B , find the area of the triangle OAB where O is the origin point.

[b] Find the solution set in $\mathbb{R}$: $8x^3 + 7 = 8$

5 **[a] Find the solution set for the inequality :** $2X - 1 \geq 5$ in $\mathbb{R}$

[b] Find the arithmetic mean of the following frequency distribution :

The Set	5 –	15 –	25 –	35 –	45 –	Total
Frequency	4	5	6	3	2	20

10 El-Dakahlia Governorate

Talkha Educational Directorate
A.M.D.L School



Answer the following questions :

1 **Choose the correct answer from the given ones :**

1. If $X = 3 + \sqrt{3}$ and $y = 3 - \sqrt{3}$, then $X - y =$ ....
   (a) $6\sqrt{3}$ (b) -6 (c) $\sqrt{6}$ (d) $2\sqrt{3}$
2. If the order of the median of a set of values is the fifth , then the number of these values is ....
   (a) 6 (b) 10 (c) 11 (d) 9
3. The result of $(1 + \sqrt{5})(1 - \sqrt{5}) =$ ....
   (a) 2 (b) -4 (c) $-2\sqrt{5}$ (d) $2\sqrt{5}$
4. If A (3 , – 2) , B (0 , 4) , then the slope of $\overleftrightarrow{AB} =$ ....
   (a) -2 (b) 2 (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$
5. The mean of the values 2 , 8 , 6 , 4 is ....
   (a) 3 (b) 4 (c) 5 (d) 6
6. The multiplicative inverse of $\frac{\sqrt{3}}{6}$ is ....
   (a) $-\frac{\sqrt{3}}{6}$ (b) $6\sqrt{3}$ (c) $2\sqrt{3}$ (d) $-2\sqrt{3}$

2 **Complete the following :**

1. $[-3 , 7] - \{-3 , 7\} =$ ....
2. The S.S. of the equation $X^2 + 9 = 0$ in $\mathbb{R}$ is ....
3. If the mode of 14 , 8 , $X + 5$, 8 and 14 is 8 , then $X =$ ....
4. The slope of the straight line perpendicular to y-axis is ....
5. If the volume of a sphere is $\frac{9}{2}\pi$ cm³ , then its radius length is ....

3 **[a] Find in the simplest form :** $\sqrt{18} + \sqrt[3]{54} - 3\sqrt{2} - \frac{1}{2}\sqrt[3]{16}$

[b] If $X = [-3 , 4]$, $Y =]1 , \infty[$ **, find each of the following using the number line :**

1. $X \cap Y$
2. $X - Y$

4 **[a] Find in ℝ the S.S. of the inequality :** $-7 \le -3X + 1 < 13$ and represent it on the number line.

[b] If $X = \sqrt{6} + \sqrt{5}$, $y = \frac{1}{\sqrt{6} + \sqrt{5}}$:

1 **Prove that :** X , y arc two conjugate numbers.

2 **Find :** the numerical value of $(X - y)^2$

5 [a] Graph the relation $y + 3X = 6$ and find the slope of the straight line.

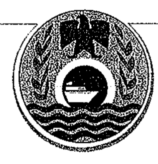
[b] Find the arithmetic mean of the following frequency distribution :

Sets	10 –	20 –	30 –	40 –	50 –	Total
Frequency	5	15	20	25	10	**75**



11 Ismailia Governorate

Directorate of Education
Math's Supervision



Answer the following questions :

1 **Choose the correct answer :**

1 A (2 , 5) , B (3 , 7) , then the slope of $\overleftrightarrow{AB}$ = ...

(a) $\frac{1}{2}$ (b) 2 (c) -2 (d) 5

2 $]3 , 5[\cup \{3 , 5\}$ = ...

(a) $]3 , 5[$ (b) $\{3 , 5\}$ (c) $[3 , 5]$ (d) $[3 , 5[$

3 The median of 4 , 11 , 8 , 16 , 9 , 14 is ....

(a) 10 (b) 8 (c) 16 (d) 9

4 $\mathbb{Q} \cup \mathbb{Q}'$ = ...

(a) $\varnothing$ (b) ℝ (c) ℤ (d) ℕ

5 The slope of X-axis is ....

(a) negative. (b) positive. (c) undefined. (d) zero.

6 $\mathbb{Z}^+ \cap \mathbb{Z}^-$ = ...

(a) zero (b) $\varnothing$ (c) ℤ (d) ℕ

2 **Complete :**

1 The mean of 12 , 13 , 10 , 11 , 14 is ....

2 The multiplicative inverse of $\sqrt{3} - \sqrt{2}$ is ....

3 The mode of 5 , 11 , 6 , 2 , 11 , 7 is ....

4 If $\frac{X}{y} = 1$, then $X - y$ = ...

5 $\sqrt{5^2 - 4^2}$ = ...



3 **[a] Find the S.S. in $\mathbb{R}$ of :** $8 \le 3X + 2 \le 17$ and represent it on the number line.

[b] Simplify : $\sqrt{72} + 3\sqrt{18} - 2\sqrt{\frac{1}{2}}$

4 [a] The volume of a cylinder is 1540 cm^3. , if its height is 10 cm. , find its diameter length. $(\pi = \frac{22}{7})$

[b] Graph the relation : $y = -3$

5 [a] If $X = [-1, \infty[$, $Y =]-4, 3]$, **using the number line find :**

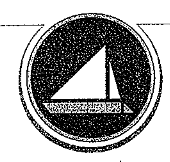
1. $X \cap Y$
2. $X \cup Y$
3. $\grave{X}$

[b] Find the mean of the following frequency distribution :

Sets	10 –	20 –	30 –	40 –	50 –	Total
Frequency	8	12	14	9	7	50

12 Damietta Governorate

Damietta Inspection of mathematics
Official Language Schools



Answer the following questions :

1 **Choose the correct answer from those given :**

1. $\sqrt{25} - \sqrt[3]{-125} = \cdots\cdots$
   (a) zero (b) 10 (c) 5 (d) ± 5
2. The multiplicative inverse of $\frac{\sqrt{2}}{6}$ is $\cdots\cdots$
   (a) $\sqrt{2}$ (b) $2\sqrt{2}$ (c) $3\sqrt{6}$ (d) $3\sqrt{2}$
3. If the lower limit of a set is 4 and the upper limit is 8 , then its centre is $\cdots\cdots$
   (a) 8 (b) 6 (c) 4 (d) 2
4. The solution set of the equation $X^2 + 9 = 0$ in $\mathbb{R}$ is $\cdots\cdots$
   (a) $\{3\}$ (b) $\{-3\}$ (c) $\varnothing$ (d) $\{-3, 3\}$
5. The arithmetic mean of the values $6 - k$, 12 , 18 and $k + 4$ is $\cdots\cdots$
   (a) 9 (b) 10 (c) 15 (d) 40
6. If the volume of a cube is 27 cm^3 , then the perimeter of one of its faces is $\cdots\cdots$ cm.
   (a) 12 (b) 9 (c) 36 (d) 3

2 **Complete each of the following :**

1. The slope of the straight line passing through the points $(1, -1)$ and $(-3, 7)$ is $\cdots\cdots$
2. If the ordered pair $(k, 2k)$ satisfies the relation $X + y = 15$, then $k = \cdots\cdots$
3. The point of intersection of the ascending and descending cumulative frequency curves determines $\cdots\cdots$ on the set-axis.



4 If three times of a number is 60 , then $\frac{1}{5}$ of this number equals ....

5 If the mode of the values 5 , 9 , 5 , $x + 3$, 9 is 9 , then $x =$ ....

3 [a] If $x = \sqrt{5} + \sqrt{2}$, $y = \frac{3}{x}$, **then find the value of :** $\frac{x + y}{x y}$ in its simplest form.

[b] Find in $\mathbb{R}$ the solution set of the inequality : $-3 \leq 4x - 7 \leq 5$

[c] A right circular cylinder whose height is 8 cm. and its volume is 72 π cm^3.
Find the length of the radius of its base.

4 **[a] Find in its simplest form :** $\sqrt{50} + \sqrt[3]{54} - 10\sqrt{\frac{1}{2}} - \sqrt[3]{16}$

[b] If X = [– 1 , 5[and Y = [2 , ∞[, **find using the number line :**

1 $X \cup Y$ 2 $X \cap Y$ 3 $X - Y$

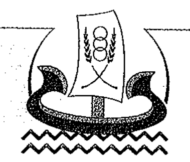
5 [a] Find three ordered pairs satisfying the relation $2x + y = 7$, then represent it graphically.

[b] Find the arithmetic mean of the following frequency distribution :

Sets	5 –	15 –	25 –	35 –	45 –	Total
Frequency	4	5	6	3	2	20

13 Kafr El-Sheikh Governorate

Directorate of Education
Math's Supervision



Answer the following questions :

1 **Choose the correct answer :**

1 $(\sqrt{5} + \sqrt{3})^2 (\sqrt{5} - \sqrt{3})^2 =$ ....

(a) 2 (b) 3 (c) 4 (d) 8

2 If the lower limit of a set is 4 and the upper limit is 8 , then its centre is ....

(a) 8 (b) 6 (c) 4 (d) 2

3 $2 \in$ ....

(a)]– 1 , ∞[(b)]2 , 5[(c)]– ∞ , 1[(d) {22}

4 If (– 1 , 5) satisfies the relation $3x + k y = 7$, then k = ...

(a) 7 (b) 4 (c) 3 (d) 2

5 If the slope of the straight line $a x + b y + 1 =$ zero is undefined , then = ...

(a) a = b (b) a = zero (c) b = zero (d) a = – b

6 The intersection point of the ascending and descending cumulative frequency curves determines the .... on the sets axis.

(a) mode (b) median (c) mean (d) centre

2 Complete :

1 The slope of the straight line passing through the two points (2 , 6) and (– 1 , 3) equals ....

2 If the mode of the values 4 , 11 , 8 , 2 x is 4 , then x = ...

3 If the mean of the values 9 , 6 , 5 , 14 is k , then k = ...

4 If the volume of a sphere = 36 π cm^3 , then its diameter length = ... cm.

5 The degree of the algebraic term 3 x^2 y^2 is ....

3

[a] Find the volume of the right circular cylinder whose diameter length of its base is 10 cm. and its height is 7 cm. $\left(\pi = \frac{22}{7}\right)$

[b] If X =]– ∞ , 5] , Y =]1 , 7]

, find by using the number line : 1 X ∩ Y 2 X ∪ Y 3 Y – X

[c] **Find the S.S. of the equation :** $8x^3 + 7 = 8$ in $\mathbb{R}$

4

[a] Represent graphically the relation y = x + 2 and if (– 4 , a) satisfies the relation , find the value of a

[b] **Simplify :** $\sqrt{18} + \sqrt{50} - 2\sqrt{8}$

[c] **Find in $\mathbb{R}$ the S.S. of the inequality :** $-8 < 3x + 1 \le 4$

5

[a] If $x = \sqrt{3} + \sqrt{2}$, $y = \frac{1}{\sqrt{3}+\sqrt{2}}$ **, then find the value of :** $\frac{x+y}{xy}$

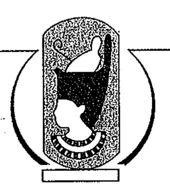
[b] **From the following frequency table with equal sets :**

The Set	10 –	20 –	30 –	40 –	50 –	60 – 70	Total
Frequency	12	15	25	27	k + 4	4	100

1 Find the value of k 2 Calculate the median.

14 Souhag Governorate

Maths Supervision



Answer the following questions :

1 Choose the correct answer from those given :

1 If the mode of the values 5 , 8 , 6 + x , 9 is 9 , then x = ...

(a) 5 (b) 6 (c) 3 (d) 8

2 The volume of a cube is 27 cm^3 , then the area of one of its faces is ....

(a) 3 cm^2 (b) 9 cm^2 (c) 36 cm^2 (d) 54 cm^2



3 The slope of any line parallel to X-axis equals ....

(a) 1 (b) undefined (c) -1 (d) zero

4 The multiplicative inverse of $\frac{2\sqrt{3}}{6}$ is ....

(a) $\sqrt{2}$ (b) 6 (c) $\sqrt{3}$ (d) zero

5 $\mathbb{Q} \cup \mathbb{Q}' =$ ....

(a) $\varnothing$ (b) 0 (c) $\mathbb{R}$ (d) $\mathbb{Z}$

6 If $(-1, 5)$ satisfies the relation $3X + ky = 7$, then $k =$ ....

(a) 5 (b) 6 (c) 2 (d) 7

2 Complete the following :

1 $[1, 5] - \{1, 5\} =$ ....

2 The S.S. of the equation : $X(X^2 - 1) = 0$ in $\mathbb{R}$ is ....

3 $(2X^2 y) \times (\text{..............}) = 12X^3 y$

4 The arithmetic mean of the values 8, 6, 3, 7, 1 is ....

5 $\sqrt[3]{64} + \sqrt{16} =$ ....

3 [a] Use the following table to find the relation between X, y :

X	-1	0	1	2
y	-1	1	3	5

[b] Find the S.S. of the inequality : $-2 < 3X + 7 \le 10$ in $\mathbb{R}$, then represent the interval of the S.S. on the number line.

4 [a] If $X = \sqrt{3} + \sqrt{2}$, $y = \frac{1}{\sqrt{3} + \sqrt{2}}$, **then find the value of :** $\frac{X + y}{X y}$

[b] If $X =]-2, 1]$, $Y = [0, 3[$, **use the number line to find :**

1 $X \cap Y$ 2 $X \cup Y$ 3 $X - Y$

5 [a] Simplify : 1 $\sqrt{50} + \sqrt{18} - \sqrt{32}$ 2 $\sqrt[3]{54} + 8\sqrt[3]{\frac{1}{4}} + 5\sqrt[3]{16}$

[b] Find the arithmetic mean of the following frequency distribution :

Sets	5 –	15 –	25 –	35 –	45 –	Total
Frequency	4	5	6	3	2	20



15 Luxor Governorate

Luxor Directorate
El-Salam Private Language School



Answer the following questions :

1 Choose the correct answer :

1. The smallest prime number is ....
   (a) 0 (b) 1 (c) 2 (d) 3
2. If the mode of the set of values 4 , 11 , 8 , 2 X is 4 , then X = ...
   (a) 2 (b) 4 (c) 6 (d) 8
3. If (2 , 5) satisfies the relation 3 X + y = c , then c = ...
   (a) 1 (b) – 1 (c) 11 (d) – 11
4. The solution set of the equation $X^2 + 9 = 0$ in $\mathbb{R}$ is ....
   (a) $\varnothing$ (b) $\{-3\}$ (c) $\{3\}$ (d) $\{3 , -3\}$
5. The lower limit of a set is 4 and the upper limit is 8 , then its centre is ....
   (a) 2 (b) 4 (c) 6 (d) 8
6. 4.274 ≃ .... $\left(\text{to the nearest } \frac{1}{10}\right)$
   (a) 4 (b) 4.2 (c) 4.3 (d) 4.27

2 Complete :

1. $[2 , 7] - \{2 , 7\}$ = ...
2. The coefficient of the algebraic term $5\,a^3\,b^2$ is ....
3. The mean of 3 , 5 , 7 , 4 , 1 is ....
4. The slope of any line parallel to y-axis is ....
5. The median of the values 3 , 7 , 6 , 9 , 2 is ....

3

[a] Simplify to the simplest form : $\sqrt{27} - \sqrt{12} + \sqrt{300}$

[b] If $a = \sqrt{5} + \sqrt{3}$, $b = \sqrt{5} - \sqrt{3}$, **find :** $a^2 + 2\,ab + b^2$

4

[a] Find the S.S. in $\mathbb{R}$ of the inequality : $2X + 1 \leq 7$, then represent it on the number line.

[b] Find the volume of the sphere whose diameter length is 4.2 cm. $\left(\pi = \frac{22}{7}\right)$

5

[a] Let A (2 , – 1) , B (10 , 3) and C (2 , 3). Find the slope of each of $\overleftrightarrow{AB}$ and $\overleftrightarrow{BC}$

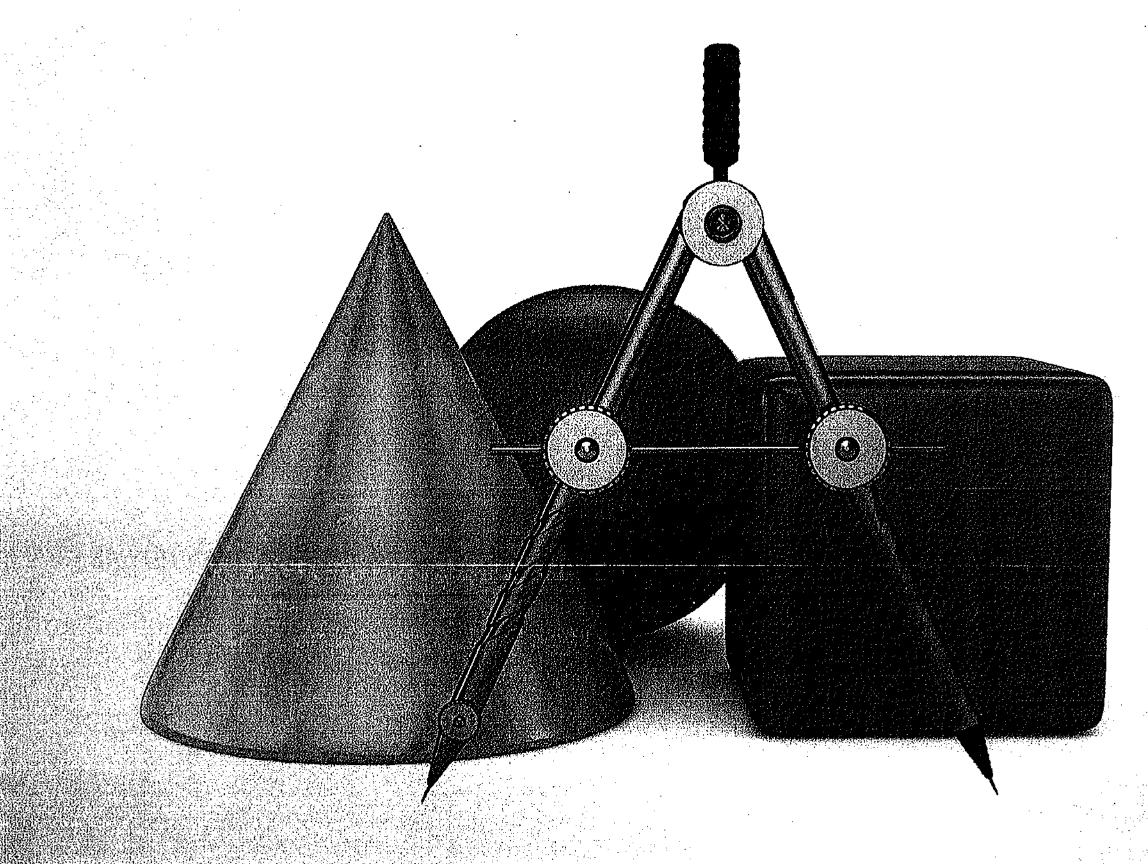
[b] Find the arithmetic mean of the following distribution :

Sets	5 –	15 –	25 –	35 –	45 –	Total
Frequency	4	5	6	3	2	20





Geometry





Quizzes

on Geometry



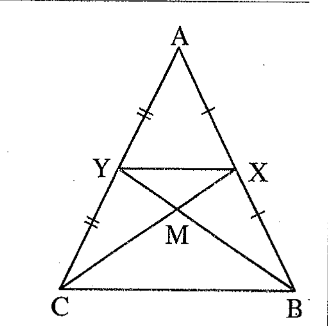
Quiz 1 on lesson 1 – unit 4



1 Complete the following :

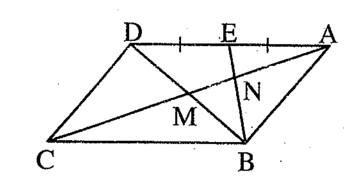
1. The medians of the triangle intersect at ....
2. The point of intersection of the medians of the triangle divides each of them by the ratio .... : .... from the vertex.
3. If $\overline{AD}$ is a median in Δ ABC and M is the point of intersection of its medians , AM = 6 cm. , then AD = ... cm.

2 [a] In the opposite figure :



ABC is a triangle , X is the midpoint of $\overline{AB}$
, Y is the midpoint of $\overline{AC}$
, XM = 4 cm. , XY = 5 cm. , BY = 12 cm.
Find : The perimeter of Δ MBC

[b] In the opposite figure :



ABCD is a parallelogram whose diagonals intersect at M
, E is the midpoint of $\overline{AD}$
, $\overline{BE} \cap \overline{AC} = \{N\}$
Prove that : $AN = \frac{1}{3} AC$

Quiz 2 till lesson 2 – unit 4



1 Complete the following :

1. The length of the median drawn from the vertex of the right angle of the right-angled triangle = ...
2. In Δ ABC if $\overline{AD}$ is a median of length 12 cm. , M is the point of intersection of medians , then AM = ... cm.
3. The length of the side opposite to the angle whose measure = 30° in the right-angled triangle = ...

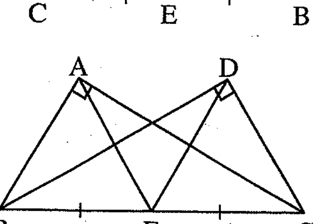
2 [a] In the opposite figure :

ABC is a triangle in which :
m (∠ B) = 90° , m (∠ C) = 30° , AC = 9 cm.
, $\overline{AE}$ and $\overline{BD}$ are two medians intersecting at M
Find : The length of each of $\overline{BD}$, $\overline{BM}$ and $\overline{AB}$

[b] In the opposite figure :

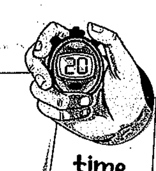


m (∠ BAC) = m (∠ BDC) = 90° , E is the midpoint of $\overline{BC}$
Prove that : AE = DE





Quiz 3 till lesson 3 – unit 4



1 Complete the following :

1. The measure of any exterior angle of the equilateral triangle = ...°
2. ABC is an isosceles triangle in which AB = AC , m (∠ A) = 110° , then m (∠ B) = ...°
3. If the length of the median which is drawn from a vertex of a triangle equals half the length of the opposite side to this vertex , then the angle at this vertex is ....

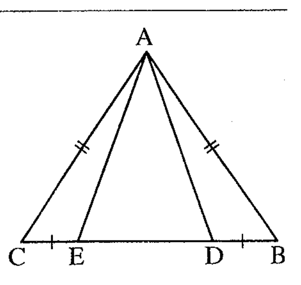
2 [a] In the opposite figure :

ABC is a triangle in which : AB = AC

, D ∈ $\overline{BC}$ and E ∈ $\overline{BC}$

such that : BD = EC

Prove that : AD = AE

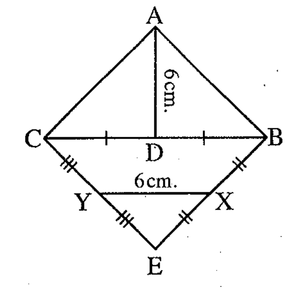


[b] In the opposite figure :

AD = XY = 6 cm. , D is the midpoint of $\overline{BC}$

, X is the midpoint of $\overline{BE}$, Y is the midpoint of $\overline{CE}$

Prove that : m (∠ BAC) = 90°



Quiz 4 till lesson 4 – unit 4



1 Complete the following :

1. The isosceles triangle in which the measure of one of its angles = 60° is ....
2. If ABC is a triangle in which : m (∠ B) = 50° and m (∠ C) = 80° , then BC = ...
3. In Δ ABC , if m (∠ A) = 30° , m (∠ B) = 90° , then : BC = ... AC

2 [a] In the opposite figure :

E ∈ $\overrightarrow{CB}$, D ∈ $\overline{AB}$,

ED = DB = EB and m (∠ A) = 30°

Prove that :

ABC is an isosceles triangle.

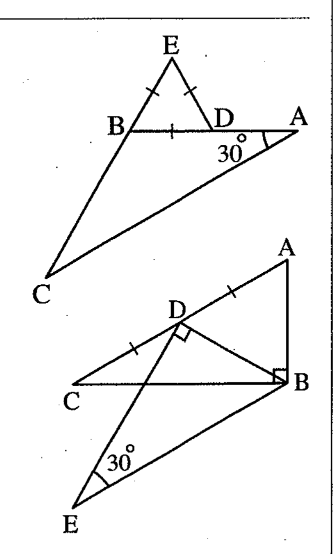
[b] In the opposite figure :

m (∠ ABC) = m (∠ BDE) = 90°

, m (∠ E) = 30°

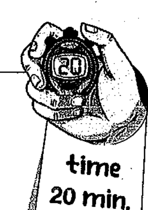
, D is the midpoint of $\overline{AC}$

Prove that : AC = BE





Quiz 5 till lesson 5 – unit 4



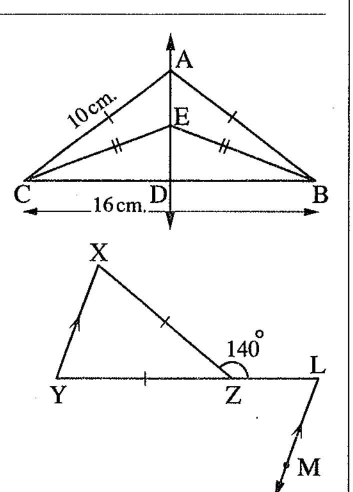
1 Complete the following :

1. The bisector of the vertex angle of the isosceles triangle ....
2. If $\overline{AD}$ is a median in Δ ABC , M is the point of intersection of its medians , then DM = ... AD
3. Any point on the axis of symmetry of a line segment is .... from its terminals.

2 [a] In the opposite figure :

ABC is a triangle in which : AB = AC = 10 cm. , BE = EC , BC = 16 cm. and $\overleftrightarrow{AE} \cap \overline{BC} = \{D\}$

Find : The length of $\overline{AD}$ ABC is an isosceles triangle.



[b] In the opposite figure :

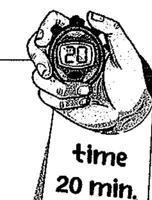
$Z \in \overline{LY}$, XZ = ZY

, m ($\angle$ LZX) = 140°

, $\overrightarrow{LM} \parallel \overline{XY}$

Find : m ($\angle$ MLY)

Quiz  till lesson 1 – unit 5



1 Complete the following :

1. The measure of any exterior angle of a triangle is greater than ....
2. In Δ ABC if $\overline{AD}$ is a median , M is the point of intersection of medians , then AM = ... AD
3. If $x > y$, $z < y$, then x .... z

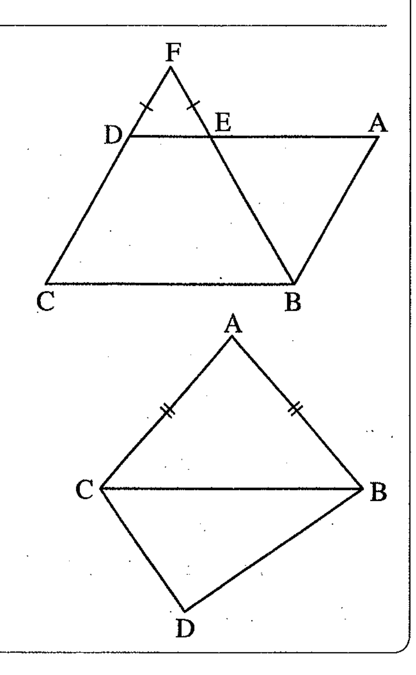
2 [a] In the opposite figure :

ABCD is a parallelogram ,

$E \in \overline{AD}$, $\overrightarrow{BE} \cap \overline{CD} = \{F\}$

in which EF = DF

Prove that : Δ BAE is an isosceles triangle.



[b] In the opposite figure :

AB = AC and m ($\angle$ BCD) > m ($\angle$ CBD)

Prove that :

m ($\angle$ ACD) > m ($\angle$ ABD)

Quiz 7 till lesson 2 – unit 5



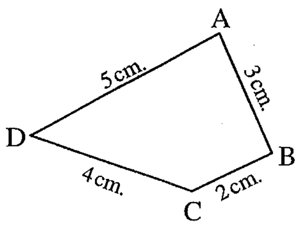
1 Complete the following :

1. In a triangle , if two sides have unequal lengths , the longer is opposite ....
2. The perpendicular to a line segment from its midpoint is .... to it.
3. If ABC is a triangle in which : AB = 4 cm. , BC = 5 cm. and AC = 6 cm. , then :

   m (∠ ....) > m (∠ ....) > m (∠ ....)

---

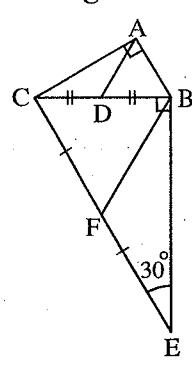
2 **[a] In the opposite figure :**



ABCD is a quadrilateral

Prove that : m (∠ ABC) > m (∠ ADC)

[b] In the opposite figure :



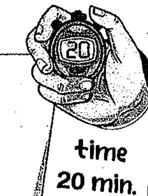
m (∠ BAC) = m (∠ CBE) = 90°

, m (∠ BEC) = 30°

, D and F are the midpoints of $\overline{BC}$ and $\overline{CE}$ respectively.

Prove that : $AD = \frac{1}{2} BF$

Quiz 8 till lesson 3 – unit 5

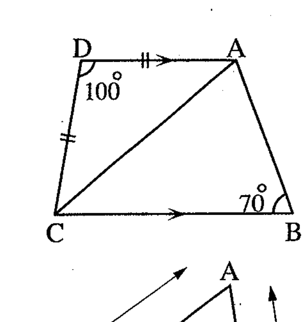


1 Complete the following :

1. The longest side in the right-angled triangle is ....
2. In Δ ABC : If m (∠ A) = 60° and m (∠ B) = 70° , then the shortest side is ....
3. In Δ ABC , if AB = AC , m (∠ A) = 2 m (∠ B) , then m (∠ C) = ...°

---

2 **[a] In the opposite figure :**



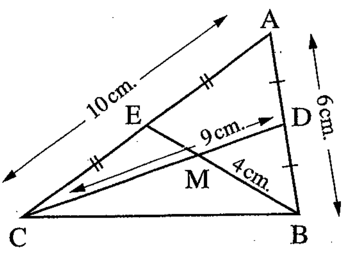
$\overline{AD}$ // $\overline{BC}$, AD = DC ,

m (∠ B) = 70° and m (∠ D) = 100°

Prove that :

1. AC > AB
2. Δ ABC is an isosceles triangle.

[b] In the opposite figure :



AB = 6 cm. , AC = 10 cm.

, BM = 4 cm. , CD = 9 cm.

, D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

Find : The perimeter of the figure ADME



Quiz (9) till lesson 4 – unit 5



1 Choose the correct answer from the given ones :

1 In Δ ABC : If AB = 6 cm. and AC = 7 cm. then BC ∈ ....

(a)]6 , 13] (b) [6 , 7] (c)] 1 , 13[(d) [1 , 7[

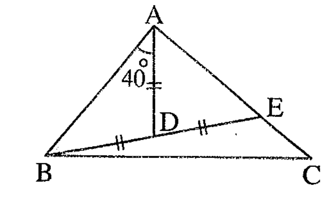
2 An isosceles triangle in which the measure of the vertex angle is 100° , then the measure of one of the two base angles = ...

(a) 80° (b) 40° (c) 50° (d) 100°

3 The numbers that can be lengths of sides of a triangle are ....

(a) 7 , 7 , 14 (b) 3 , 4 , 9 (c) 4 , 5 , 12 (d) 5 , 5 , 5

2 [a] In the opposite figure :



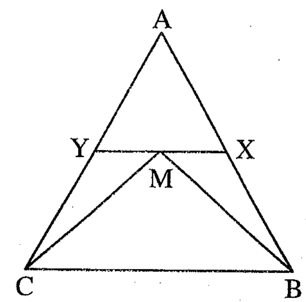
AD = BD = ED , m (∠ DAB) = 40°

Prove that :



1 AD < AB 2 BC > AC

[b] In the opposite figure :



ABC is a triangle in which $X \in \overline{AB}$, $Y \in \overline{AC}$, $M \in \overline{XY}$

Prove that : AB + AC > MB + MC



Final Revision

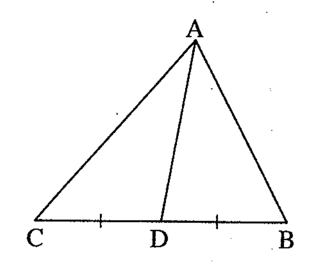
of Geometry



Revision for the important theorems, corollaries and rules of geometry

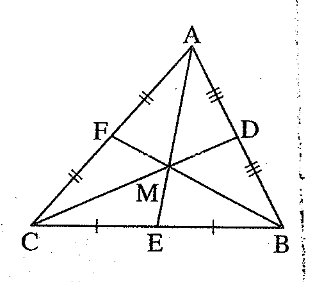
Medians of triangle

The median of the triangle is the line segment drawn from any vertex of the triangle vertices to the midpoint of the opposite side of this vertex.



If D is the midpoint of $\overline{BC}$, then $\overline{AD}$ is a median in ΔABC

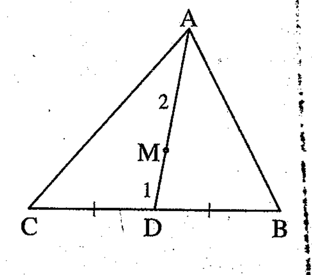
The medians of a triangle are concurrent.



If $\overline{CD}$, $\overline{BF}$ and $\overline{AE}$ are the medians of ΔABC where $\overline{CD} \cap \overline{BF} \cap \overline{AE} = \{M\}$, then M is the intersection point of medians of ΔABC

The point of concurrence of the medians of the triangle divides each median in the ratio of :

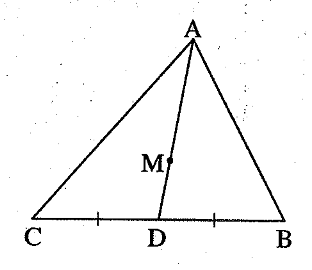
- 1 : 2 from the base.
- 2 : 1 from the vertex.



If M is the intersection point of medians of ΔABC, then :

- $DM = \frac{1}{2} AM$
- $AM = 2 DM$
- $DM = \frac{1}{3} AD$
- $AM = \frac{2}{3} AD$

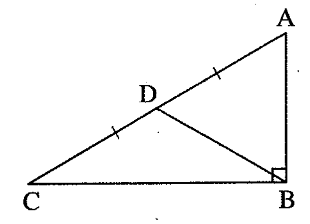
The point which divides the median in a triangle by the ratio 1 : 2 from the base is the point of the intersection of the medians of the triangle.



If DM : MA = 1 : 2, then M is the intersection point of medians of ΔABC

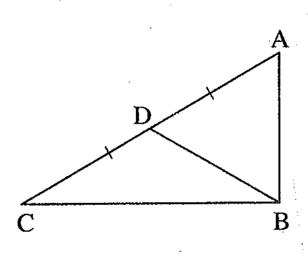
Right-angled triangle

The length of the median from the vertex of the right angle equals half the length of the hypotenuse.



If Δ ABC is right-angled at B , $\overline{BD}$ is a median in it , then $BD = \frac{1}{2} AC$

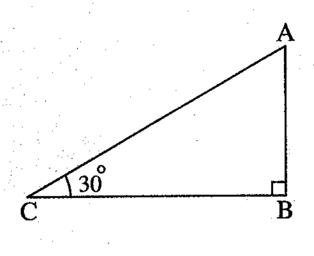
If the length of the median drawn from a vertex of a triangle equals half the length of the opposite side to this vertex , then the angle at this vertex is right.



If $\overline{BD}$ is a median in Δ ABC , $BD = \frac{1}{2} AC$

$\therefore m(\angle ABC) = 90°$

The length of the side opposite to the angle of measure 30° in the right-angled triangle equals half the length of the hypotenuse.

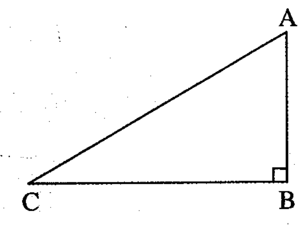


If Δ ABC is a right-angled at B in which :

$m(\angle C) = 30°$

, then $AB = \frac{1}{2} AC$

In the right-angled triangle, the hypotenuse is the longest side of the triangle.

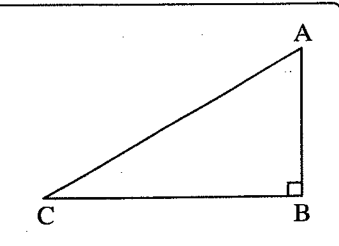


If Δ ABC is a right-angled at B , then

$AC > AB$, $AC > BC$

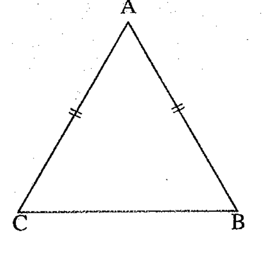
If Δ ABC is a right-angled at B , then :

- $(AC)^2 = (AB)^2 + (BC)^2$
- $(AB)^2 = (AC)^2 - (BC)^2$
- $(BC)^2 = (AC)^2 - (AB)^2$



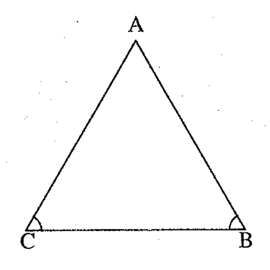
The isosceles triangle

The base angles of the isosceles triangle are congruent.



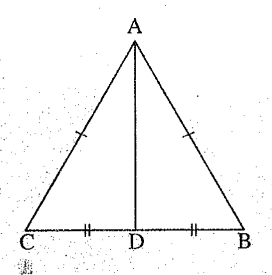
If Δ ABC in which :
AB = AC , then
m ($\angle$ B) = m ($\angle$ C)

If two angles of a triangle are congruent , then the two sides opposite to these two angles are congruent and the triangle is isosceles.



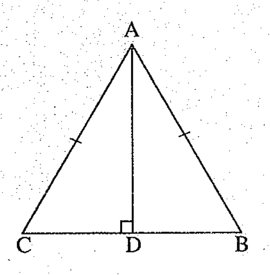
If Δ ABC in which :
m ($\angle$ B) = m ($\angle$ C)
, then AB = AC

The median of an isosceles triangle from the vertex angle bisects it and is perpendicular to the base.



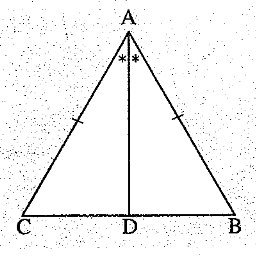
If Δ ABC in which :
AB = AC , $\overline{AD}$ is a median
, then $\overrightarrow{AD}$ bisects $\angle$ BAC
, $\overline{AD} \perp \overline{BC}$

The straight line drawn passing through the vertex angle of an isosceles triangle perpendicular to the base bisects each of the base and the vertex angle.



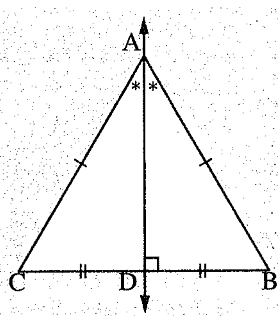
If Δ ABC in which :
AB = AC , $\overline{AD} \perp \overline{BC}$
, then D is the midpoint of $\overline{BC}$,
$\overrightarrow{AD}$ bisects $\angle$ BAC

The bisector of the vertex angle of an isosceles triangle bisects the base and is perpendicular to it.



If Δ ABC in which :
AB = AC , $\overrightarrow{AD}$ bisects $\angle$ BAC , then D is the midpoint of $\overline{BC}$, $\overline{AD} \perp \overline{BC}$

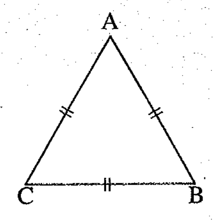
The number of axes of symmetry of the isosceles triangle = 1



If Δ ABC in which :
AB = AC , $\overleftrightarrow{AD} \perp \overline{BC}$ and intersect it at D
, then $\overleftrightarrow{AD}$ is the axis of symmetry of the triangle ABC

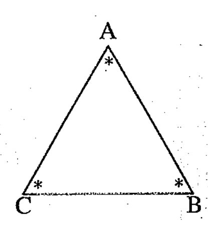
The equilateral triangle

If the triangle is an equilateral , then it is equiangular where each angle measure is 60°



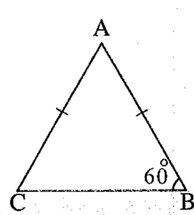
If Δ ABC in which :
AB = BC = CA , then
m (∠ A) = m (∠ B) = m (∠ C) = 60°

If the angles of a triangle are congruent , then the triangle is equilateral.



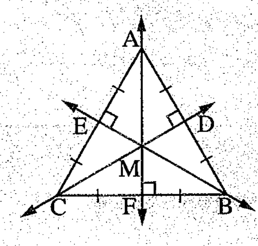
If Δ ABC in which :
m (∠ A) = m (∠ B) = m (∠ C)
, then AB = BC = CA

The isosceles triangle in which the measure of one of its angles = 60° is an equilateral triangle.



If Δ ABC in which :
AB = AC , m (∠ B) = 60°
, then Δ ABC is an equilateral triangle.

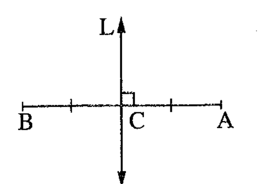
The equilateral triangle has three axes of symmetry.



If Δ ABC is an equilateral triangle
, $\overleftrightarrow{AF} \perp \overline{BC}$, $\overleftrightarrow{CD} \perp \overline{AB}$, $\overleftrightarrow{BE} \perp \overline{AC}$
, then $\overleftrightarrow{AF}$, $\overleftrightarrow{CD}$ and $\overleftrightarrow{BE}$ are the axes of symmetry of the triangle ABC

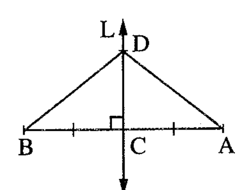
The axis of symmetry

The axis of symmetry of a line segment is the straight line perpendicular to it from its middle.



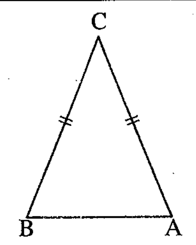
If the straight line L ⊥ $\overline{AB}$, C ∈ $\overline{AB}$ where CA = CB , C ∈ the straight line L , then L is the axis of $\overline{AB}$

Any point on the axis of symmetry of a line segment is at equal distances from its terminals (end points).



If the straight line L is the axis of $\overline{AB}$, D ∈ the straight line L , then DA = DB

If a point is at equal distances from the two terminals of a line segment , then this point lies on the axis of this line segment.



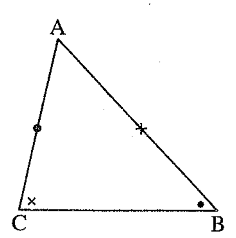
If CA = CB , then C lies on the axis of $\overline{AB}$



Inequality relations in the triangle

Comparing the measures of angles in a triangle

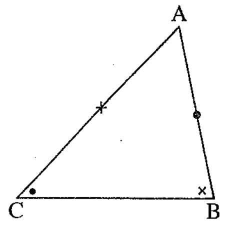
If two sides have unequal lengths , the longer is opposite to the angle of the greater measure



If AB > AC , then m (∠ C) > m (∠ B)

Comparing the lengths of sides in a triangle

If two angles are unequal in measure , then the greater angle in measure is opposite to a side greater in length than that opposite to the other angle.



If m (∠ B) > m (∠ C) , then AC > AB

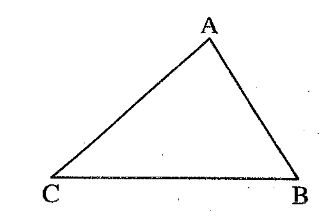
Triangle inequality

In any triangle , the sum of the lengths of any two sides is greater than the length of the third side.

AB + BC > AC

, BC + CA > AB

, CA + AB > BC



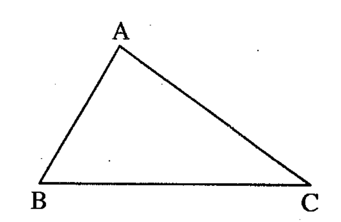
Notice that



- The length of any side in a triangle is greater than the difference between the lengths of the two other sides and less than their sum.

  In Δ ABC :

  AC – AB < BC < AC + AB



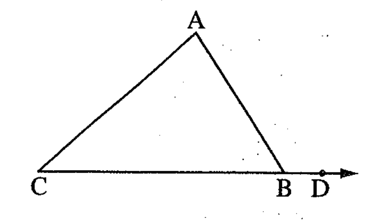
- The measure of any exterior angle of a triangle is greater than the measure of any interior angle of the triangle except its adjacent angle.

  In Δ ABC :

  m (∠ ABD) > m (∠ A)

  , m (∠ ABD) > m (∠ C)





Proofs of the important theorems

Theorem

In the right-angled triangle , the length of the median from the vertex of the right angle equals half the length of the hypotenuse.

Given ABC is a triangle in which m (∠ ABC) = 90° ,
$\overline{BD}$ is a median in the triangle ABC

R.T.P. $BD = \frac{1}{2} AC$

Construction Draw $\overrightarrow{BD}$ and take the point E ∈ $\overrightarrow{BD}$ such that BD = DE

Proof In the figure ABCE : ∵ $\overline{AC}$ and $\overline{BE}$ bisect each other

∴ The figure ABCE is a parallelogram.

∵ m (∠ ABC) = 90°

∴ The figure ABCE is a rectangle.

∴ BE = AC

, ∵ $BD = \frac{1}{2} BE$

∴ $BD = \frac{1}{2} AC$ (Q.E.D.)

Theorem

If the length of the median drawn from a vertex of a triangle equals half the length of the opposite side to this vertex , then the angle at this vertex is right.

Given In Δ ABC , $\overline{BD}$ is a median and DA = DB = DC

R.T.P. m (∠ ABC) = 90°

Construction Draw $\overrightarrow{BD}$, then take the point E ∈ $\overrightarrow{BD}$ such that BD = DE

Proof ∵ $BD = \frac{1}{2} BE = \frac{1}{2} AC$ ∴ BE = AC

∴ In the figure ABCE :

$\overline{AC}$ and $\overline{BE}$ are equal in length and bisect each other.

∴ The figure ABCE is a rectangle.

∴ m (∠ ABC) = 90° (Q.E.D.)

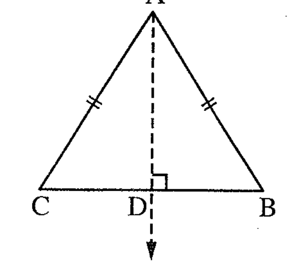
Theorem

The base angles of the isosceles triangle are congruent.

Given ABC is a triangle in which $\overline{AB} \equiv \overline{AC}$

R.T.P. $\angle B \equiv \angle C$

Construction Draw $\overrightarrow{AD} \perp \overline{BC}$ where $\overrightarrow{AD} \cap \overline{BC} = \{D\}$



Proof $\because \Delta\Delta$ ADB , ADC in which :

- $m(\angle ADB) = m(\angle ADC) = 90^\circ$ (const.)
- $\overline{AB} \equiv \overline{AC}$ (given)
- $\overline{AD}$ is a common side

$\therefore \Delta ADB \equiv \Delta ADC$, then we deduce that $\angle B \equiv \angle C$ (Q.E.D.)

Theorem

If two angles of a triangle are congruent , then the two sides opposite to these two angles are congruent and the triangle is isosceles.

Given ΔABC in which $\angle B \equiv \angle C$

R.T.P. $\overline{AB} \equiv \overline{AC}$

Construction bisect $\angle BAC$ by $\overrightarrow{AD}$ to intersect $\overline{BC}$ at D

Proof $\because \angle B \equiv \angle C$

$\therefore m(\angle B) = m(\angle C)$

$\because \overrightarrow{AD}$ bisects $\angle BAC$ $\therefore m(\angle BAD) = m(\angle CAD)$

$\because$ The sum of measures of the interior angles of the triangle $= 180^\circ$

$\therefore m(\angle ADB) = m(\angle ADC)$

$\therefore$ In $\Delta\Delta$ ABD and ACD :

- $\overline{AD}$ is a common side
- $m(\angle BAD) = m(\angle CAD)$ (const.)
- $m(\angle ADB) = m(\angle ADC)$ (by proof)

$\therefore \Delta ABD \equiv \Delta ACD$, then we deduce that

$\overline{AB} \equiv \overline{AC}$, then ΔABC is an isosceles triangle. (Q.E.D.)

Theorem

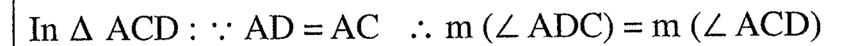
In a triangle , if two sides have unequal lengths , the longer is opposite to the angle of the greater measure.

Given ABC is a triangle in which AB > AC

R.T.P. m (∠ ACB) > m (∠ ABC)

Construction Take D ∈ $\overline{AB}$ such that AD = AC

Proof



In Δ ACD : ∵ AD = AC ∴ m (∠ ADC) = m (∠ ACD) (1)

∵ ∠ ADC is an exterior angle of Δ DBC

∴ m (∠ ADC) > m (∠ B) (2)

From (1) and (2) : ∴ m (∠ ACD) > m (∠ B)

, ∵ m (∠ ACB) > m (∠ ACD)

∴ m (∠ ACB) > m (∠ ABC) (Q.E.D.)

Theorem

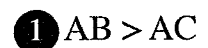
In a triangle , if two angles are unequal in measure , then the greater angle in measure is opposite to a side greater in length than that opposite to the other angle.

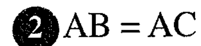
Given ABC is a triangle in which m (∠ C) > m (∠ B)

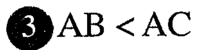
R.T.P. AB > AC

Proof ∵ $\overline{AB}$ and $\overline{AC}$ are two line segments.

∴ One of the following cases should be verified.

 1 AB > AC

 2 AB = AC

 3 AB < AC

Unless AB > AC , then either AB = AC **or** AB < AC

- If : AB = AC , then m (∠ C) = m (∠ B) and this contradicts the given where m (∠ C) > m (∠ B)
- If : AB < AC , then m (∠ C) < m (∠ B) according to the preceding theorem.

Again this contradicts the given , where m (∠ C) > m (∠ B)

∴ It should be that AB > AC (Q.E.D.)



Final Examinations

on Geometry



Model 1

Answer the following questions :

1 Complete the following :

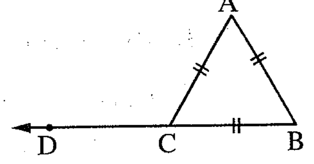
1. The longest side in the right-angled triangle is ....
2. If the lengths of two sides in a triangle are 2 cm. and 7 cm. , then :
   .... < the length of the third side < ....
3. If the measures of two angles in a triangle are different , then the greater in measure of them is opposite to ....
4. If the length of the median drawn from a vertex of a triangle equals half the opposite side to this vertex in length , then ....
5. If the measure of an angle in the isosceles triangle equals 60° , then the triangle is ....

2 Choose the correct answer from those given :

1. **In the opposite figure :**

   Δ ABC is equilateral , then m (∠ ACD) = ...

   (a) 45° (b) 60°
   (c) 120° (d) 135°



2. In Δ ABC which is right-angled at B , if AC = 20 cm. , then the length of the median of the triangle drawn from B equals ....

   (a) 10 cm. (b) 8 cm. (c) 6 cm. (d) 5 cm.

3. XYZ is a triangle in which : m (∠ Z) = 70° and m (∠ Y) = 60° , then YZ .... XY

   (a) > (b) < (c) = (d) twice

4. The lengths which can be lengths of sides of a triangle are ....

   (a) 0 , 3 , 5 (b) 3 , 3 , 5 (c) 3 , 3 , 6 (d) 3 , 3 , 7

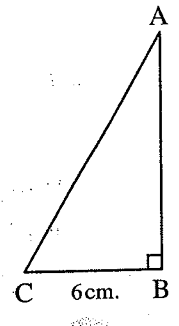
5. The triangle in which the measures of two angles of it are 42° and 69° is ....

   (a) an isosceles triangle. (b) an equilateral triangle.
   (c) a scalene triangle. (d) a right-angled triangle.

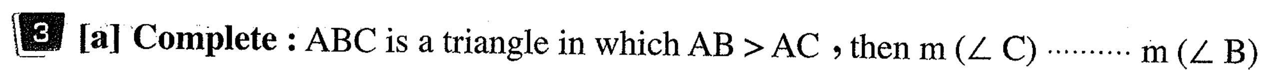
6. **In the opposite figure :**

   m (∠ C) = 2 m (∠ A)
   , BC = 6 cm.
   , then AC = ... cm.

   (a) 3 (b) 6
   (c) 9 (d) 12

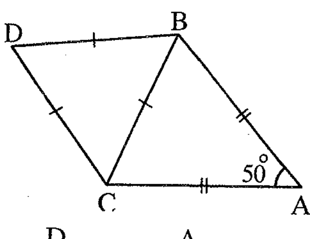






3 **[a] Complete :** ABC is a triangle in which AB > AC , then m (∠ C) .... m (∠ B)

[b] In the opposite figure :

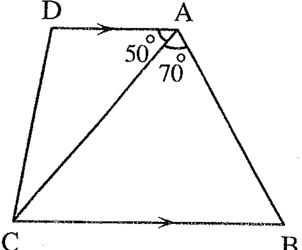


m (∠ A) = 50° , AB = AC

and Δ DBC is equilateral

Find : m (∠ ABD)

[c] In the opposite figure :



$\overline{AD}$ // $\overline{BC}$

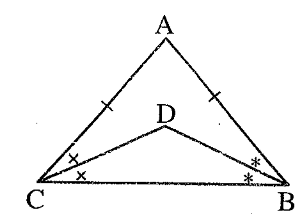
, m (∠ BAC) = 70°

and m (∠ DAC) = 50°

Prove that : BC > AC

4 **[a] Prove that :** The two base angles of the isosceles triangle are congruent.

[b] In the opposite figure :

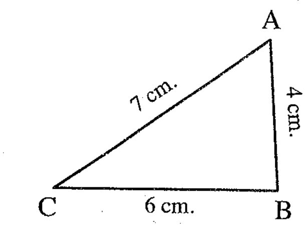


AB = AC , $\overrightarrow{BD}$ bisects ∠ B

and $\overrightarrow{CD}$ bisects ∠ C

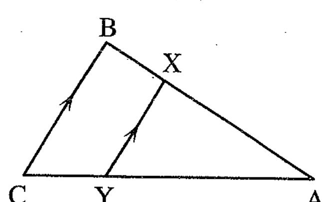
Prove that : Δ DBC is isosceles.

5 **[a] In the opposite figure :**



Arrange the angles of Δ ABC descendingly due to their measures

[b] In the opposite figure :



AB > BC , $\overline{XY}$ // $\overline{BC}$

Prove that : AX > XY

Model 2

Answer the following questions :

1 **Choose the correct answer from those given :**

1. The triangle which has three axes of symmetry is .... triangle.
   (a) scalene (b) isosceles (c) right-angled (d) equilateral
2. The sum of lengths of two sides in a triangle is .... the length of the third side.
   (a) greater than (b) smaller than (c) equals to (d) twice
3. If the lengths of two sides in an isosceles triangle are 8 cm. and 4 cm. , then the length of the third side is .... cm.
   (a) 4 (b) 8 (c) 3 (d) 12

4 In Δ ABC if m ($\angle$ B) = 130° , then the longest side of it is ....

(a) $\overline{BC}$ (b) $\overline{AC}$ (c) $\overline{AB}$ (d) its median.

5 Δ XYZ is an isosceles triangle in which : m ($\angle$ X) = 100° , then m ($\angle$ Y) = ...

(a) 100° (b) 80° (c) 60° (d) 40°

6 **In the opposite figure :**

$x + y$ = ...

(a) 100° (b) 140°

(c) 180° (d) 280°



2 Complete the following :

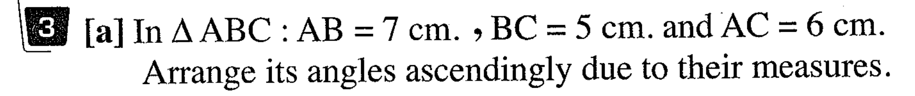
1 If the measure of an angle in a right-angled triangle is 45° , then the triangle is ....

2 The length of any side in a triangle .... the sum of lengths of the two other sides.

3 If $\overline{AB} \equiv \overline{XY}$, then AB = ...

4 In Δ ABC , if m ($\angle$ A) = 30° and m ($\angle$ B) = 90° , then BC = ... AC

5 The axis of symmetry of a line segment is the straight line which .... at its midpoint.



3 [a] In Δ ABC : AB = 7 cm. , BC = 5 cm. and AC = 6 cm.

Arrange its angles ascendingly due to their measures.

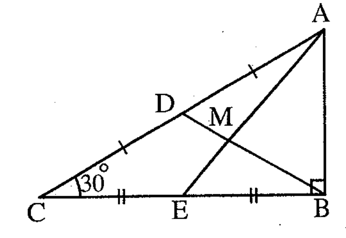
[b] In the opposite figure :

Δ ABC is right-angled at B

, m ($\angle$ C) = 30° , D is the midpoint of $\overline{AC}$

, E is the midpoint of $\overline{BC}$, AC = 9 cm.

Find the length of each of : $\overline{BD}$, $\overline{BM}$ and $\overline{AB}$



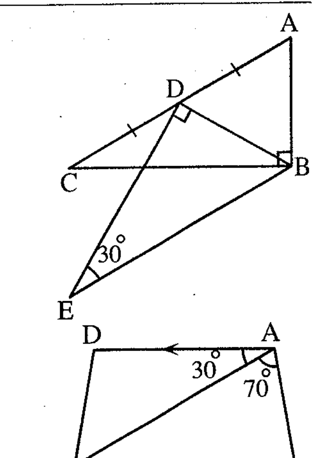
4 [a] In the opposite figure :

m ($\angle$ ABC) = m ($\angle$ BDE) = 90°

, m ($\angle$ E) = 30°

, D is the midpoint of $\overline{AC}$

Prove that : AC = BE



[b] In the opposite figure :

$\overleftrightarrow{AD}$ // $\overline{BC}$, m ($\angle$ BAC) = 70°

, m ($\angle$ DAC) = 30°

Prove that : AC > BC



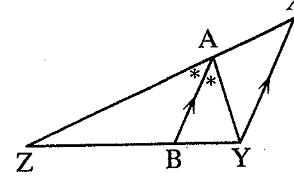
5 [a] Complete :

If the measures of two angles of a triangle are different , then their greater in measure is opposite to ....

[b] In the opposite figure :

$\overleftrightarrow{AB}$ // $\overline{XY}$ and $\overrightarrow{AB}$ bisects $\angle$ YAZ

Prove that : XZ > YZ





Model for the merge students

Answer the following questions :

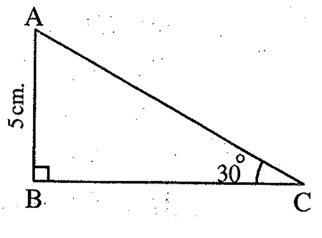
1 Complete each of the following :

1. The point of concurrence of the medians of the triangle divides each median in the ratio .... : .... from the base.
2. In the right-angled triangle , the length of the median drawn from the vertex of the right angle equals ....
3. The base angles of the isosceles triangle are ....
4. In Δ ABC : m (∠ B) = 70° , m (∠ C) = 50° , then AC .... AB
5. The median of the isosceles triangle from the vertex angle .... , ...

2 Choose the correct answer from those given :

1. If ABC is an equilateral triangle , then m (∠ B) = ...
   (a) 30° (b) 60° (c) 70° (d) 90°
2. The length of the side opposite to the angle of measure 30° in the right-angled triangle equals .... the length of the hypotenuse.
   (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) 2
3. If the measure of the vertex angle of an isosceles triangle is 80° , then the measure of one of the base angles equals ....
   (a) 60° (b) 40° (c) 30° (d) 50°
4. The number of axes of symmetry of the isosceles triangle is ....
   (a) 1 (b) 2 (c) 3 (d) zero
5. In Δ ABC : m (∠ A) = 50° , m (∠ B) = 60° , then the longest side is ....
   (a) $\overline{AB}$ (b) $\overline{BC}$ (c) $\overline{AC}$

3 In the opposite figure , complete :



Δ ABC is a right-angled triangle at B , m (∠ C) = 30° , AB = 5 cm.

Find : The length of $\overline{AC}$

∵ m (∠ B) = ... , m (∠ C) = ...

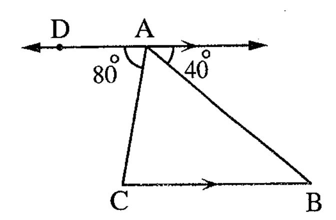
∴ AB = $\frac{1}{2}$ × .... ∴ AC = ... cm.

4 [a] In ΔABC : $m(\angle A) = 40°$, $m(\angle B) = 75°$, $m(\angle C) = 65°$

Arrange the lengths of the sides of the triangle descendingly.

The order is : .... , ... , ...

[b] In the opposite figure :



$\overleftrightarrow{AD} \parallel \overline{BC}$

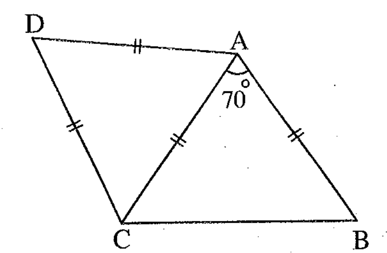
Complete :

1 $m(\angle B) = ...°$

2 The side .... is the longest side of ΔABC

---

5 In the opposite figure :



$AB = AC = CD = AD = 10$ cm.

, $m(\angle BAC) = 70°$

Put (✓) or (×) :

1 $m(\angle B) = 55°$ ( )

2 $m(\angle D) = 70°$ ( )

3 $m(\angle DCB) = 120°$ ( )

4 $AB + AD = 20$ cm. ( )

5 $AB + BC = BC + CD$ ( )



1 Cairo Governorate

Centre Cairo Educative Zone
Saint Joseph College Khoronfish



Answer the following questions :

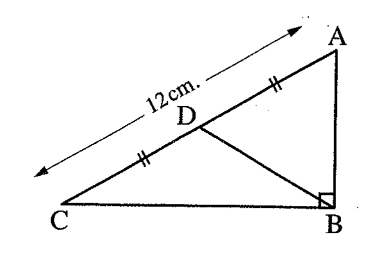
1 Choose the correct answer from the given ones :

1. In Δ ABC , if AB = 6 cm. and AC = 7 cm. , then BC ∈ ....
   (a)]6 , 13] (b) [6 , 7] (c)]1 , 13[(d) [1 , 7[
2. The point of intersection of the medians of the triangle divides each of them in the ratio of .... from the vertex.
   (a) 1 : 2 (b) 1 : 3 (c) 2 : 1 (d) 2 : 3
3. The measure of any exterior angle of the equilateral triangle equals ....°
   (a) 60 (b) 100 (c) 120 (d) 150
4. In Δ ABC , if $\overline{AD}$ is a median , M is the point of intersection of its medians , then AM = ... AD
   (a) $\frac{1}{2}$ (b) 2 (c) $\frac{2}{3}$ (d) $\frac{3}{2}$
5. Δ XYZ is an isosceles triangle in which m (∠ X) = 110° , then m (∠ Y) = ...°
   (a) 110 (b) 35 (c) 60 (d) 45
6. In Δ ABC , if $\overline{AB} \perp \overline{BC}$ and AB = BC , then m (∠ A) = ...°
   (a) 30 (b) 45 (c) 60 (d) 90

2 Complete the following :

1. The number of axes of symmetry of the equilateral triangle equals ....
2. The base angles in an isosceles triangle are ....
3. The longest side in the right-angled triangle is ....
4. The bisector of the vertex angle of the isosceles triangle ....
5. **In the opposite figure :**

   AC = 12 cm. , then BD = ... cm.



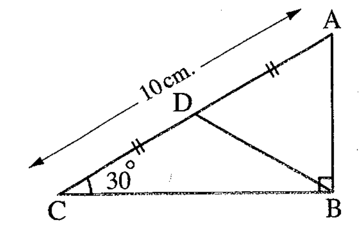


3 [a] In Δ ABC , if m (∠ A) = $(6X)°$, m (∠ B) = $(4X - 9)°$

and m (∠ C) = $3(X - 2)°$

Arrange the side lengths of Δ ABC ascendingly.

[b] In the opposite figure :

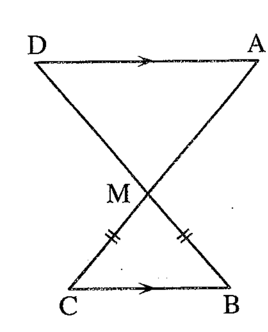


m (∠ ABC) = 90° , m (∠ C) = 30°

, AD = DC and AC = 10 cm.

Find : The perimeter of Δ ABD

4 **[a] In the opposite figure :**



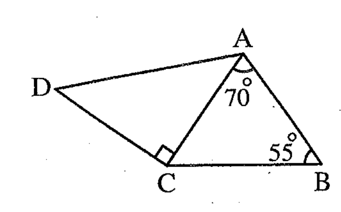
If $\overline{AC} \cap \overline{BD} = \{M\}$

, $\overline{AD} \parallel \overline{BC}$ and MB = MC

, prove that :

Δ MAD is isosceles.

[b] In the opposite figure :

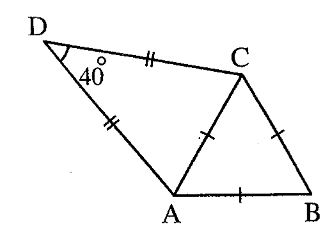


m (∠ BAC) = 70° , m (∠ B) = 55°

and m (∠ ACD) = 90°

Prove that : AD > AB

5 **[a] In the opposite figure :**



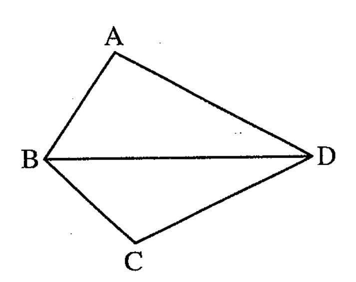
m (∠ D) = 40°

, DA = DC

and Δ ABC is an equilateral triangle.

Find : m (∠ DCB)

[b] In the opposite figure :



AB < AD and BC < CD

Prove that :

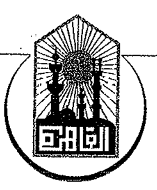
m (∠ ABC) > m (∠ ADC)





2 Cairo Governorate

Hadaik El-Kobba Educational Zone



Answer the following questions :

1 Complete :

1. The median of an isosceles triangle from the vertex angle bisects .... and is perpendicular to ....
2. The measure of the exterior angle at any vertex of the equilateral triangle is ....°
3. The base angles of the isosceles triangle are ....
4. ABC is a triangle in which AB = 4 cm. , BC = 6 cm. , then AC ∈].............. , ...[
5. The longest side in the right-angled triangle is ....

2 Choose the correct answer :

1. In Δ ABC , if AC = 4 cm. , BC = 3 cm. , then m (∠ B) .... m (∠ A)

   (a) >　　(b) <　　(c) =　　(d) ≤

2. The length of the side opposite to the angle of measure 30° in the right-angled triangle equals .... the length of the hypotenuse.

   (a) half　　(b) twice　　(c) third　　(d) quarter

3. In Δ ABC , if m (∠ A) = 100° and AB = AC , then m (∠ ABC) = ...

   (a) 80°　　(b) 60°　　(c) 40°　　(d) 30°

4. The point of intersection of the medians of the triangle divides each of them in the ratio .... from the base.

   (a) 1 : 3　　(b) 3 : 1　　(c) 1 : 2　　(d) 2 : 1

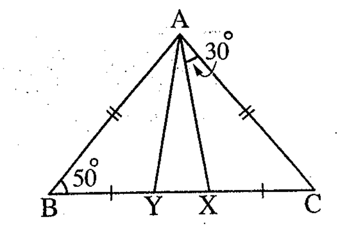
5. If Δ ABD is obtuse-angled at B and C is the midpoint of $\overline{BD}$, then the longest side is ....

   (a) $\overline{AB}$　　(b) $\overline{AC}$　　(c) $\overline{AD}$　　(d) $\overline{BD}$

6. The triangle whose side lengths are 2 cm. , (X + 3) cm. and 5 cm. becomes an isosceles triangle when X = ... cm.

   (a) 1　　(b) 2　　(c) 3　　(d) 4

3 **[a] In the opposite figure :**



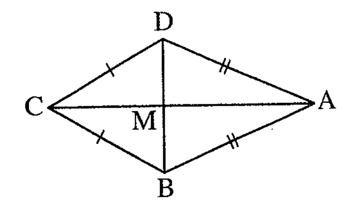
ABC is a triangle , AB = AC , XC = YB

, m (∠ B) = 50° , m (∠ CAX) = 30°

1 **Prove that :** Δ AXY is an isosceles triangle.

2 **Find :** m (∠ AYB)

[b] In the opposite figure :

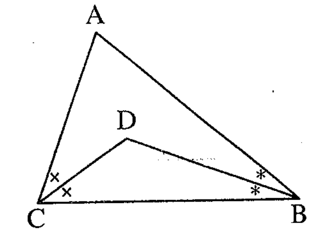


$\overline{BD} \cap \overline{AC} = \{M\}$

, AB = AD and BC = DC

Prove that : M is the midpoint of $\overline{BD}$

4 **[a] In the opposite figure :**

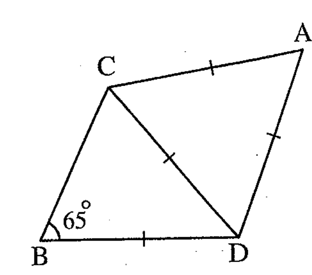


ABC is a triangle in which AB > AC , $\overrightarrow{BD}$ bisects ∠ ABC

, $\overrightarrow{CD}$ bisects ∠ ACB

Prove that : BD > CD

[b] In the opposite figure :

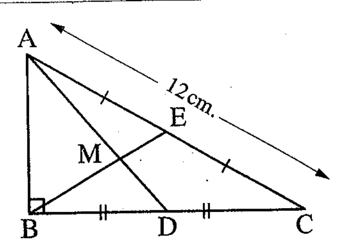


AD = DC = AC = BD

, m (∠ B) = 65°

Find with proof : m (∠ BDA)

5 **[a] In the opposite figure :**



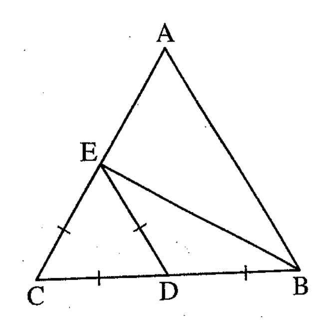
Δ ABC is right-angled at B

, E and D are the midpoints of $\overline{AC}$ and $\overline{BC}$ respectively

, AC = 12 cm.

Find the length of each of : $\overline{BE}$ and $\overline{ME}$

[b] In the opposite figure :



ABC is a triangle , D ∈ $\overline{BC}$ and E ∈ $\overline{AC}$

such that BD = CD = CE = DE

Prove that : 1 BC > BE

2 AB + BD > AE



3 Cairo Governorate

Rod El-Farag Educational Zone
S.T. Mary's School



Answer the following questions :

1 Choose the correct answer from the given ones :

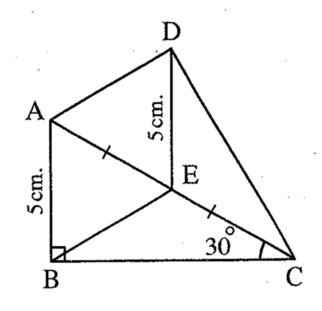
1. In the triangle XYZ , if m ($\angle$ Z) = 70° and m ($\angle$ Y) = 60° , then YZ .... XY
   (a) > (b) = (c) < (d) twice
2. The measure of the exterior angle of the equilateral triangle equals ....
   (a) 45° (b) 60° (c) 90° (d) 120°
3. The intersection point of the medians of a triangle divides each of them from the direction of the base in the ratio ....
   (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 2 : 3
4. ABCD is a rectangle , M is the point of intersection of its diagonals , if the length of the diagonal is 6 cm. , then the length of the median $\overline{AM}$ equals .... cm.
   (a) 3 (b) 6 (c) 9 (d) 12
5. ABC is an isosceles triangle where AB = AC and m ($\angle$ A) = 100° , then m ($\angle$ B) = ...
   (a) 60° (b) 50° (c) 40° (d) 30°
6. The number of axes of symmetry of the isosceles triangle equals ....
   (a) 0 (b) 1 (c) 2 (d) 3

2 Complete :

1. If the measures of two angles of a triangle are different , then the greater in measure is opposite to ....
2. The bisector of the vertex angle of the isosceles triangle .... , ...
3. The base angles of the isosceles triangle are ....
4. In any triangle , the sum of the lengths of any two sides .... the length of the third side.
5. Δ ABC is right-angled at B , m ($\angle$ A) = 30° , AC = 10 cm. , then CB = ... cm.

3 **[a]** ABC is a triangle in which AB = AC , $\overrightarrow{BD}$ bisects $\angle$ ABC , $\overrightarrow{CD}$ bisects $\angle$ ACB , $\overrightarrow{BD} \cap \overrightarrow{CD} = \{D\}$ **Prove that :** Δ DBC is an isosceles triangle.

[b] In the opposite figure :



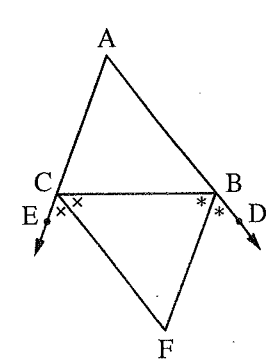
ABC is a right-angled triangle at B

, m ($\angle$ ACB) = 30° , AB = 5 cm.

, E is the midpoint of $\overline{AC}$, if DE = 5 cm.

, **prove that :** m ($\angle$ ADC) = 90°

4 **[a] In the opposite figure :**



ABC is a triangle in which AB > AC , D $\in \overrightarrow{AB}$, E $\in \overrightarrow{AC}$

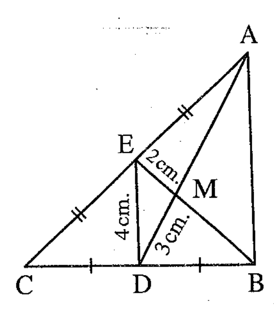
, $\overrightarrow{BF}$ bisects $\angle$ DBC , $\overrightarrow{CF}$ bisects $\angle$ BCE

, $\overrightarrow{BF} \cap \overrightarrow{CF} = \{F\}$

Prove that : 1 m ($\angle$ FBC) > m ($\angle$ BCF)

2 CF > BF

[b] In the opposite figure :

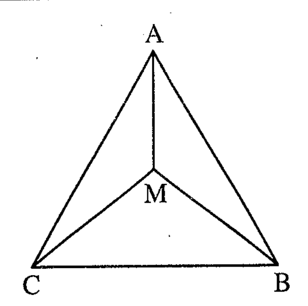


ABC is a triangle in which ME = 2 cm. , MD = 3 cm.

, DE = 4 cm. , D and E are the midpoints of $\overline{BC}$, $\overline{AC}$ respectively

Find : The perimeter of Δ MAB

5 **[a] In the opposite figure :**

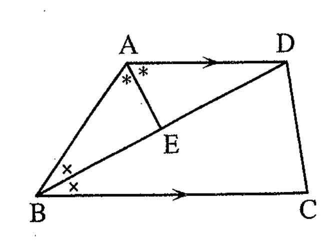


ABC is a triangle in which

M is a point inside it.

Prove that : MA + MB + MC > $\frac{1}{2}$ the perimeter of Δ ABC

[b] In the opposite figure :



ABCD is a quadrilateral in which $\overline{AD}$ // $\overline{BC}$

, $\overrightarrow{BD}$ bisects $\angle$ ABC , $\overrightarrow{AE}$ bisects $\angle$ BAD

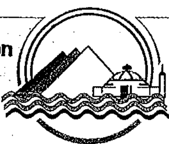
Prove that : 1 AB = AD   2 $\overline{AE} \perp \overline{BD}$

3 BE = ED



4 Giza Governorate

Boulaq El Dakrour Directorate of Education
Dar El-Hanan Lang. Sch. for Girls



Answer the following questions :

1 Choose the correct answer :

1. The number of axes of symmetry of the isosceles triangle equals ....

   (a) 3 (b) 2 (c) 1 (d) 0

2. The point of intersection of the medians of the triangle divides each of them in the ratio of .... from the base.

   (a) 2 : 1 (b) 3 : 1 (c) 3 : 2 (d) 1 : 2

3. Δ XYZ is right-angled at Y , then XZ .... YZ

   (a) $>$ (b) $<$ (c) $=$ (d) $\leq$

4. If 10 cm. , 5 cm. and x cm. are side lengths of an isosceles triangle , then $x =$ ....

   (a) 10 (b) 5 (c) 15 (d) 4

5. The measure of the exterior angle of an equilateral triangle equals ....°

   (a) 30 (b) 60 (c) 90 (d) 120

6. **In the opposite figure :**

   $x + y =$ ....

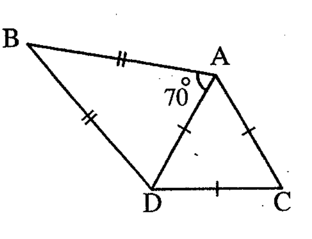
   (a) 100° (b) 140°
   (c) 180° (d) 280°

   100° y° x°

2 Complete the following :

1. In Δ ABC , if m ($\angle$ B) = 70° , m ($\angle$ C) = 50° , then AC .... AB
2. In Δ ABC , if m ($\angle$ A) = m ($\angle$ B) + m ($\angle$ C) , then the longest side is ....
3. The axis of symmetry of a line segment is the straight line which .... from its midpoint.
4. ABC is a triangle in which AB = 4 cm. , CB = 7 cm.
   , then AC $\in$] .... , ... [
5. If $\overline{AD}$ is a median in Δ ABC , and M is the point of intersection of its medians and AM = 12 cm. , then AD = ...

3 **[a] In the opposite figure :**



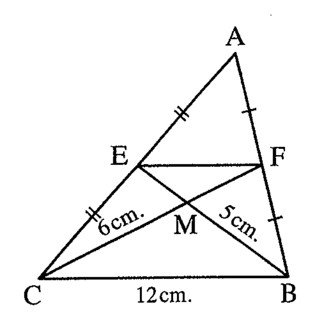
$AB = BD$, $m(\angle BAD) = 70°$

, ΔADC is an equilateral triangle.

Find : $m(\angle BDC)$



[b] In the opposite figure :

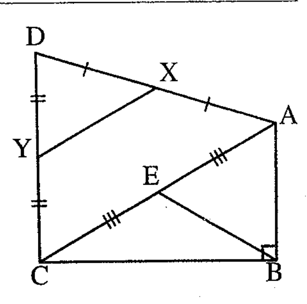


ABC is a triangle , F and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively.

If $BM = 5$ cm. , $CM = 6$ cm. , $BC = 12$ cm.

, **then find :** The perimeter of ΔMEF

4 **[a] In the opposite figure :**



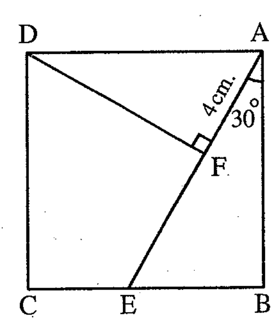
$m(\angle ABC) = 90°$

, E is the midpoint of $\overline{AC}$

and X , Y are the midpoints of $\overline{DA}$ and $\overline{DC}$

Prove that : $XY = BE$

[b] In the opposite figure :



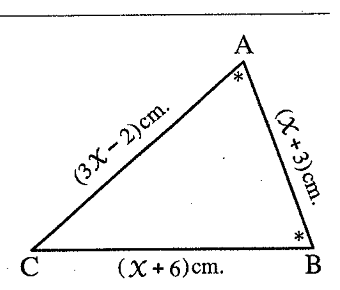
ABCD is a square , $E \in \overline{BC}$

where $m(\angle BAE) = 30°$ and $\overline{DF} \perp \overline{AE}$

, if $AF = 4$ cm.

, **calculate :** The area of the square ABCD

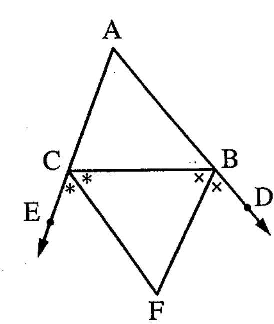
5 **[a] In the opposite figure :**



$m(\angle A) = m(\angle B)$

Find : The perimeter of ΔABC

[b] In the opposite figure :



ABC is a triangle in which :

$AB > AC$, $D \in \overrightarrow{AB}$, $E \in \overrightarrow{AC}$

, $\overrightarrow{BF}$ bisects $\angle DBC$, $\overrightarrow{CF}$ bisects $\angle BCE$

, $\overrightarrow{BF} \cap \overrightarrow{CF} = \{F\}$

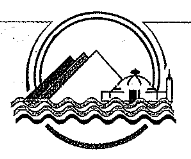
Prove that : 1 $m(\angle FBC) > m(\angle BCF)$

2 $CF > BF$



5 Giza Governorate

6th October Directorate
Om El-Moamneen Lang. School



Answer the following questions :

1 Choose the correct answer :

1 If ABC is an isosceles triangle , m (∠ A) = 60° , AB = 4 cm.
, then its perimeter = ... cm.

(a) 4 (b) 12 (c) 6 (d) 9

2 XYZ is a triangle in which m (∠ Z) = 70° , m (∠ Y) = 60° , then YZ .... XY

(a) > (b) < (c) = (d) ≥

3 In Δ ABC , if m (∠ B) = 90° , then the longest side is ....

(a) $\overline{BC}$ (b) $\overline{AB}$ (c) $\overline{AC}$ (d) its median.

4 A triangle has one axis of symmetry , the lengths of two sides are 4 cm. and 8 cm.
, then the length of the third side is .... cm.

(a) 3 (b) 6 (c) 4 (d) 8

5 The point of intersection of the medians of the triangle divides each of the medians in the ratio .... from the base.

(a) 2 : 1 (b) 3 : 2 (c) 2 : 4 (d) 3 : 4

6 If the length of any side of a triangle = $\frac{1}{3}$ the perimeter of the triangle , then the number of axes of symmetry of the triangle equals ....

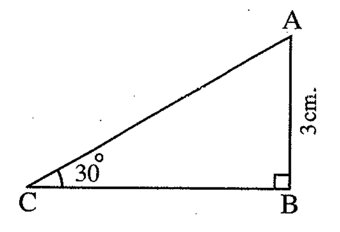
(a) 3 (b) 1 (c) 2 (d) zero

2 Complete :

1 The bisector of the vertex angle of the isosceles triangle .... and ....

2 **In the opposite figure :**

The length of $\overline{AC}$ = ...



3 In Δ ABC , m (∠ A) = m (∠ B) = m (∠ C) , then the measure of the exterior angle equals ....

4 If the lengths of two sides of a triangle are 4 cm. , 7 cm. , then the length of the third side belongs to] .... , ... [

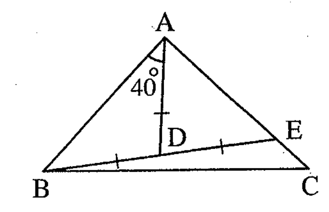
5 If ∠ X and ∠ Y are two supplementary angles , ∠ X ≡ ∠ Y , then m (∠ X) = ...°

3 **[a] In the opposite figure :**

AD = BD = ED , m (∠ DAB) = 40°

Prove that :

1 AD < AB   2 BC > AC

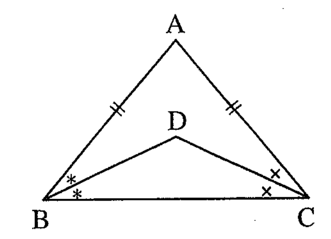


[b] In the opposite figure :

AB = AC , $\overrightarrow{BD}$ bisects ∠ ABC

and $\overrightarrow{CD}$ bisects ∠ ACB

Prove that : Δ DBC is an isosceles triangle.



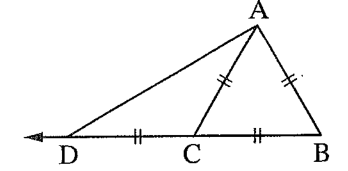
4 [a] ABC is a triangle in which m (∠ A) = (6 X)° , m (∠ B) = (4 X – 9) °

, m (∠ C) = 3 (X – 2)° Arrange the lengths of the sides of the triangle ascendingly.

[b] In the opposite figure :

AB = AC = CB = CD

Prove that : $\overline{AB} \perp \overline{AD}$



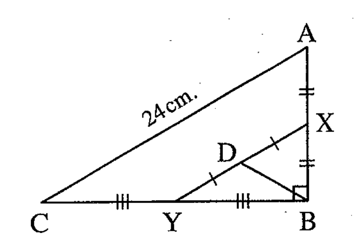
5 **[a] In the opposite figure :**

m (∠ ABC) = 90° , X is the midpoint of $\overline{AB}$

, Y is the midpoint of $\overline{BC}$

, D is the midpoint of $\overline{XY}$, AC = 24 cm.

Find : The length of $\overline{BD}$



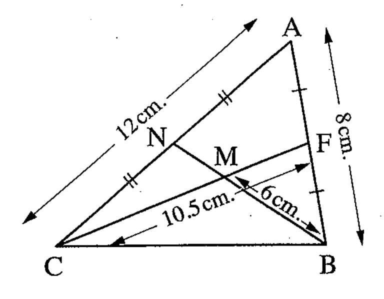
[b] In the opposite figure :

F and N are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, AB = 8 cm. , AC = 12 cm. , BM = 6 cm.

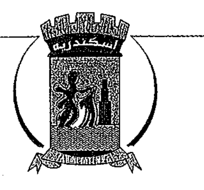
, CF = 10.5 cm.

Find : The perimeter of the figure AFMN



6 Alexandria Governorate

Middle Educational Zone
Math Supervision



Answer the following questions :

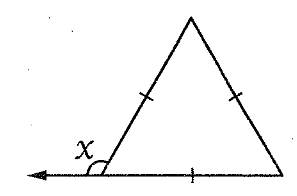
1 **Complete each of the following :**

1 If m (∠ A) = 65° , then m (complementary ∠ A) = ...°

2 In Δ ABC , m (∠ A) = 50° , m (∠ C) = 80° , then CB = ...

[3] **In the opposite figure :**

x = ...°



[4] The number of axes of symmetry for the rectangle equals ....

[5] In Δ ABC , m (∠ B) = 70° , m (∠ C) = 45° , then BC .... AC

[6] The medians of the triangle are ....

2 Choose the correct answer :

[1] The sum of lengths of two sides in a triangle is .... the length of the third side.

(a) $>$ (b) $<$ (c) = (d) twice

[2] The triangle which has no axis of symmetry is ....

(a) scalene. (b) isosceles. (c) equilateral. (d) right-angled.

[3] The numbers which can not be side lengths of a triangle are ....

(a) 3 , 3 , 3 (b) 3 , 3 , 4 (c) 3 , 3 , 5 (d) 3 , 3 , 6

[4] $\overline{BE}$ is a median in Δ ABC , M is the point of concurrence of the medians

If BM = 6 cm. , then ME = ... cm.

(a) 2 (b) 3 (c) 4 (d) 9

[5] The angle whose measure is 180° is called .... angle.

(a) an acute (b) an obtuse (c) a straight (d) a reflex

3 [a] Δ ABC is right-angled at B , if m (∠ A) = 75° , arrange the lengths of its sides descendingly.

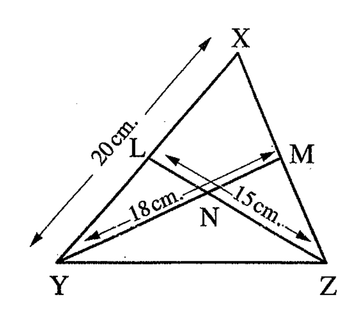
[b] In the opposite figure :

N is the point of concurrence of

the medians of Δ XYZ

, LZ = 15 cm. , YM = 18 cm. , XY = 20 cm.

Find : The perimeter of Δ NLY



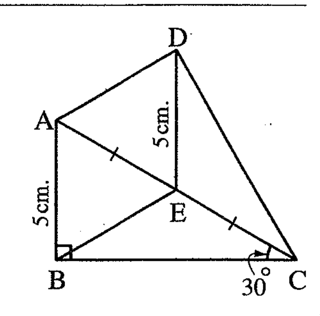
4 [a] In the opposite figure :

m (∠ ABC) = 90° , E is the midpoint of $\overline{AC}$

, m (∠ ACB) = 30°

, AB = DE = 5 cm.

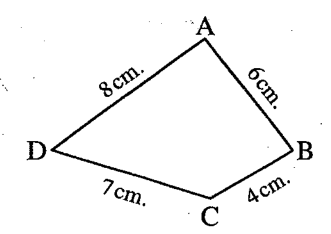
Prove that : m (∠ ADC) = 90°





[b] In the opposite figure :

Prove that : m (∠ BCD) > m (∠ BAD)



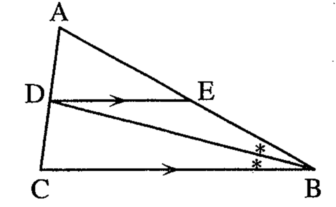
5 **[a] In the opposite figure :**

$\overrightarrow{BD}$ bisects ∠ ABC

, $\overline{DE}$ // $\overline{BC}$

Prove that :

Δ EBD is an isosceles triangle.

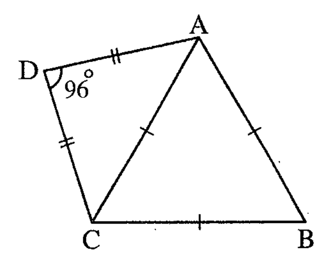


[b] In the opposite figure :

Δ ABC is equilateral , DA = DC

, m (∠ ADC) = 96°

Find : m (∠ DAB)



7 Alexandria Governorate

Agamy Educational Zone
Inspector of Maths



Answer the following questions :

1 **Choose the correct answer :**

1 XYZ is a triangle in which m (∠ Z) = 70° , m (∠ Y) = 60° , then YZ .... XY

(a) > (b) < (c) = (d) twice

2 The two diagonals are perpendicular in the ....

(a) rectangle. (b) rhombus. (c) trapezium. (d) triangle.

3 The measure of the exterior angle of the equilateral triangle equals ....°

(a) 360 (b) 120 (c) 60 (d) 180

4 If the lengths of two sides in an isosceles triangle are 3 cm. , 7 cm. , then the length of the third side is .... cm.

(a) 3 (b) 7 (c) 10 (d) 4

5 The point of concurrence of the medians of the triangle divides each median in the ratio .... from its base.

(a) 2 : 1 (b) 1 : 3 (c) 1 : 4 (d) 1 : 2

6 If the side length of an equilateral triangle is 10 cm. , then its height equals .... cm.

(a) 5 (b) 10 (c) $5\sqrt{3}$ (d) 30



2 Complete :

1. If the isosceles triangle has an angle of measure 45° , then the triangle is .... - angled triangle.

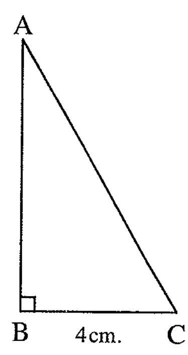
2. The sum of lengths of any two sides of a triangle is .... the length of the third side.

3. **In the opposite figure :**

   If m (∠ C) = 2 m (∠ A)

   , CB = 4 cm.

   , then AC = ... cm.



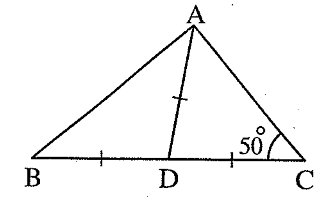
4. If the two side lengths in a triangle are 4 cm. , 7 cm. , then the length of the third side ∈].............. , ...[

5. **In the opposite figure :**

   AD = DC = BD

   , m (∠ C) = 50°

   , then m (∠ B) = ...°

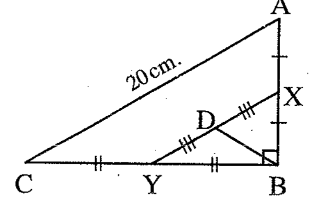


3 [a] **In the opposite figure :**

m (∠ ABC) = 90° , D is the midpoint of $\overline{XY}$

, X , Y are the midpoints of $\overline{AB}$, $\overline{BC}$ respectively , AC = 20 cm.

Find : The length of $\overline{BD}$



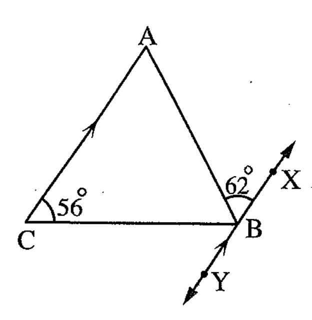
[b] **In the opposite figure :**

B ∈ $\overleftrightarrow{XY}$, $\overleftrightarrow{XY}$ // $\overline{AC}$

, m (∠ ABX) = 62°

and m (∠ C) = 56°

Prove that : AC = BC

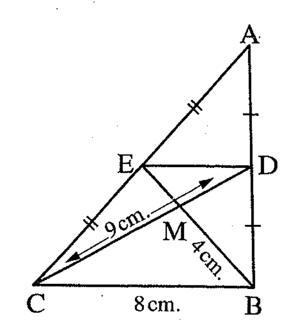


4 [a] **In the opposite figure :**

D , E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, DC = 9 cm. , MB = 4 cm. and BC = 8 cm.

Find : The perimeter of Δ DME





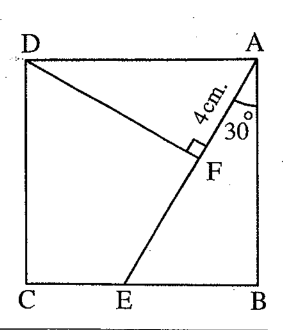
[b] In the opposite figure :

ABCD is a square , $E \in \overline{BC}$

, where m ($\angle$ BAE) = 30° and $\overline{DF} \perp \overline{AE}$

, if AF = 4 cm.

, **calculate :** The area of the square ABCD

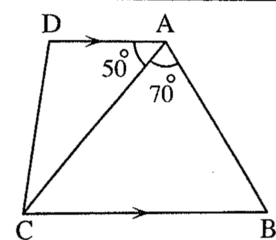


5 **[a] In the opposite figure :**

$\overline{AD}$ // $\overline{BC}$, m ($\angle$ CAB) = 70°

, m ($\angle$ DAC) = 50°

Prove that : BC > AC

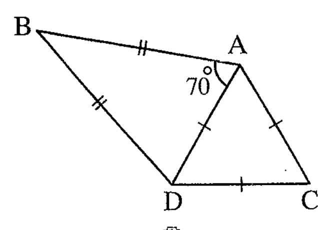


[b] In the opposite figure :

AB = BD , m ($\angle$ BAD) = 70°

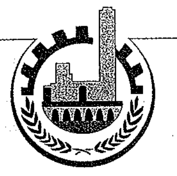
, Δ ADC is equilateral

Find : m ($\angle$ BDC)



8 El-Kalyoubia Governorate

Directorate of Education
Inspection of Mathematics



Answer the following questions :

1 **Choose the correct answer :**

1. ABC is an equilateral triangle , then m ($\angle$ A) = ...°

(a) 45 (b) 60 (c) 120 (d) 35

2. Δ XYZ is an isosceles triangle , m ($\angle$ X) = 100° , then m ($\angle$ Y) = ...°

(a) 100 (b) 80 (c) 60 (d) 40

3. The length of the side opposite to the angle of measure 30° in the right-angled triangle equals .... the length of the hypotenuse.

(a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{1}{4}$ (d) 2

4. The number of axes of symmetry of the isosceles triangle equals ....

(a) 0 (b) 1 (c) 2 (d) 3

5. If the lengths of two sides of an isosceles triangle are 2 cm. , 5 cm. , then the length of the third side equals .... cm.

(a) 2 (b) 3 (c) 4 (d) 5

6. In the triangle ABC , if m ($\angle$ A) = 50° , m ($\angle$ B) = 60° , then the longest side is ....

(a) $\overline{AB}$ (b) $\overline{BC}$ (c) $\overline{AC}$ (d) 110 cm.

2 Complete :

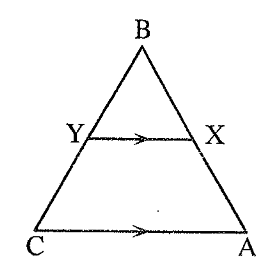
1. The medians of a triangle are ....
2. The longest side of the right-angled triangle is the ....
3. If AB = AC in the triangle ABC , then ABC is .... triangle.
4. XYZ is a triangle , m (∠ Z) = 40° , m (∠ Y) = 30° , then XY .... XZ
5. If the lengths of two sides of a triangle are 6 cm. and 9 cm. , then the length of the third side ∈].............. , ...[

3

[a] In Δ ABC , m (∠ A) = 40° , m (∠ B) = 75° , m (∠ C) = 65°

Arrange the lengths of the sides of this triangle descendingly.

[b] In the opposite figure :

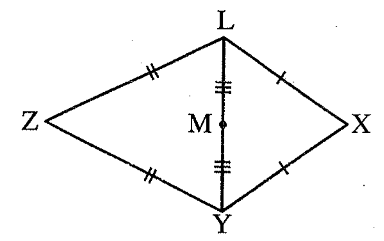


AB = BC , $\overline{XY}$ // $\overline{AC}$

Prove that : BX = BY

4

[a] In the opposite figure :

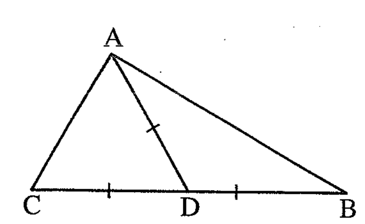


XY = XL , ZY = ZL

, LM = MY

Prove that : X , M , Z are on the same straight line.

[b] In the opposite figure :

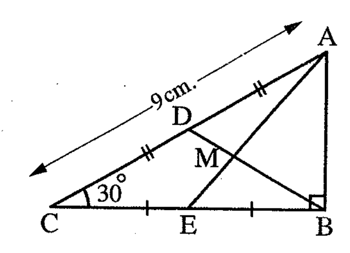


AB > AC , DB = DC = AD

Prove that : m (∠ BAD) < m (∠ CAD)

5

[a] In the opposite figure :



Δ ABC is a right-angled triangle at B

, m (∠ C) = 30° , D is the midpoint of $\overline{AC}$

, E is the midpoint of $\overline{BC}$, AC = 9 cm.



Find the length of each of : $\overline{BD}$, $\overline{BM}$, $\overline{AB}$, $\overline{MD}$

[b] ABC is a triangle such that

m (∠ A) = (2 x)° , m (∠ C) = (x + 40)° , m (∠ B) = (3 x − 10)°

Prove that : AB = AC





9 El-Sharkia Governorate

Zagazig English Language School for Girls

Answer the following questions :

1 Choose the correct answer :

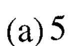
1. In Δ ABC , m ($\angle$ A) = 60° , m ($\angle$ C) = 45° , then ....
   (a) AB < AC (b) AB = AC (c) AB > AC (d) AB = BC

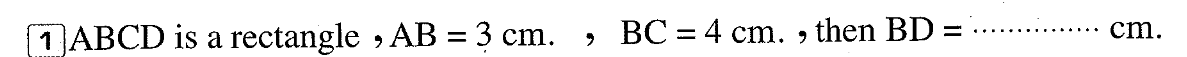
2. If M is the point of concurrence of the medians of Δ ABC , $\overline{AD}$ is a median , then MA = ...
   (a) 2 AD (b) $\frac{2}{3}$ AD (c) $\frac{3}{2}$ AD (d) $\frac{1}{2}$ MD

3. In Δ ABC , AB = 4 cm. , BC = 6 cm. , then AC $\in$ ....
   (a)]2 , 4[(b) [2 , 10] (c)]2 , 10[(d) [0 , 10]

4. The number of axes of symmetry of the equilateral triangle equals ....
   (a) zero (b) 1 (c) 2 (d) 3

5. In Δ ABC , AB = AC , m ($\angle$ B) = X + 30° , m ($\angle$ C) = 2 X + 5° , then X = ...
   (a) 25° (b) 20° (c) 35° (d) 3°

6. **In the opposite figure :**
   AD = DC , m ($\angle$ C) = 30° , m ($\angle$ ABC) = 90° , AB = 5 cm. , then the perimeter of Δ ABD = ... cm.
   (a) 5 (b) 15
   
   (c) 20 (d) 25



2 Complete :

1. ABCD is a rectangle , AB = 3 cm. , BC = 4 cm. , then BD = ... cm.
2. In Δ ABC , if D is the midpoint of $\overline{BC}$ and AD = $\frac{1}{2}$ BC , then m ($\angle$ CAB) = ...°
3. The longest side in the right-angled triangle is ....
4. If Δ ABC $\equiv$ Δ XYZ , then AC – XZ = ...
5. The median that is drawn from the vertex angle of an isosceles triangle .... and ....



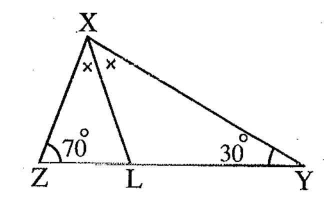
3 **[a] In the opposite figure :**

$\overrightarrow{XL}$ bisects $\angle$ YXZ , m ($\angle$ Y) = 30°

, m ($\angle$ Z) = 70°

1 **Find :** m ($\angle$ LXZ) and m ($\angle$ XLZ)

2 **Prove that :** Δ XLZ is an isosceles triangle.

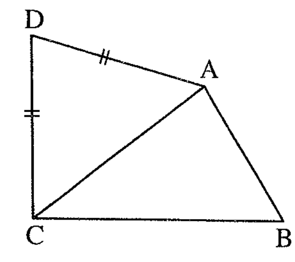


[b] In the opposite figure :

ABCD is a quadrilateral

, AD = DC , BC > AB

Prove that : m ($\angle$ BAD) > m ($\angle$ BCD)

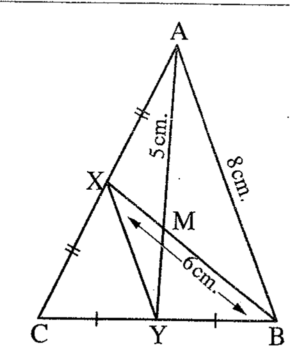


4 **[a] In the opposite figure :**

X is the midpoint of $\overline{AC}$, AB = 8 cm.

, Y is the midpoint of $\overline{BC}$, AM = 5 cm. , BX = 6 cm.

Find : The perimeter of Δ XMY



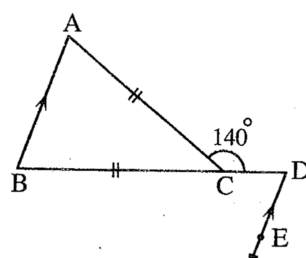
[b] In the opposite figure :

C $\in$ $\overline{BD}$, CA = CB

, $\overrightarrow{AB}$ // $\overrightarrow{DE}$

, m ($\angle$ ACD) = 140°

Find : m ($\angle$ A) and m ($\angle$ BDE)



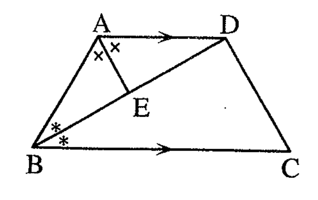
5 **[a] In the opposite figure :**

ABCD is a quadrilateral , $\overline{AD}$ // $\overline{BC}$

, $\overrightarrow{BD}$ bisects $\angle$ ABC

, $\overrightarrow{AE}$ bisects $\angle$ BAD

Prove that : 1 AD = AB 2 $\overline{AE} \perp \overline{BD}$



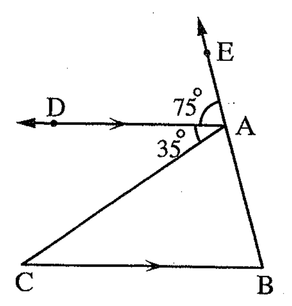
[b] In the opposite figure :

E $\in$ $\overrightarrow{BA}$, $\overrightarrow{AD}$ // $\overline{BC}$

, m ($\angle$ DAE) = 75°

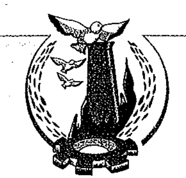
, m ($\angle$ DAC) = 35°

Prove that : BC > AB



10 El-Monofia Governorate

El-Shohadaa Directorate
Maths Supervision



Answer the following questions :

1 Choose the correct answer :

1. The intersecting point of the medians of the triangle divides each median in the ratio of .... from its base.
   (a) 1 : 2 (b) 2 : 1 (c) 3 : 1 (d) 1 : 3
2. The number of symmetry axes of the isosceles triangle is ....
   (a) 1 (b) 2 (c) 3 (d) 4
3. The sum of lengths of any two sides of a triangle .... the length of the third side.
   (a) < (b) > (c) = (d) ≡
4. The diagonals are perpendicular in the ....
   (a) trapezium. (b) parallelogram. (c) square. (d) rectangle.
5. If Δ ABC is right-angled at B , AB = 6 cm. , BC = 8 cm. , then the length of the median drawn from B equals .... cm.
   (a) 3 (b) 4 (c) 5 (d) 6
6. If 4 cm. , $(X + 3)$ cm. and 8 cm. are side lengths of an isosceles triangle , then $X =$ ....
   (a) 3 (b) 4 (c) 5 (d) 6

2 Complete each of the following :

1. The base angles in an isosceles triangle are ....
2. If m (∠ A) = 100° , then m (reflex ∠ A) = ...°
3. The number of medians of the isosceles triangle is ....
4. In Δ ABC , if AB > BC , then m (∠ A) .... m (∠ C)
5. The bisector of the vertex angle of an isosceles triangle bisects the base and ....

3 [a] In the opposite figure :

ABC is a triangle in which D , E are the midpoints of $\overline{AB}$, $\overline{AC}$, FC = 4 cm. , FB = 6 cm. and BC = 8 cm.

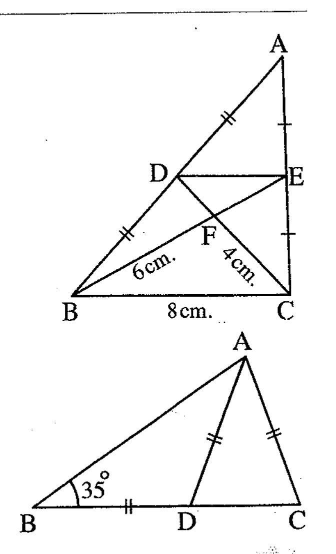
Find : The perimeter of Δ DFE

[b] In the opposite figure :

AC = AD = BD

, m (∠ B) = 35°

Find : m (∠ BAC)

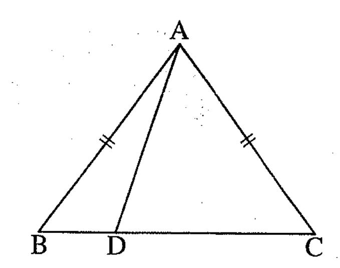


4 [a] **In the opposite figure :**

AC = AB

Prove that :

AB > AD



[b] ABC is a triangle in which m (∠ A) = 40° , m (∠ B) = 80° Arrange the lengths of the sides of the triangle descendingly.

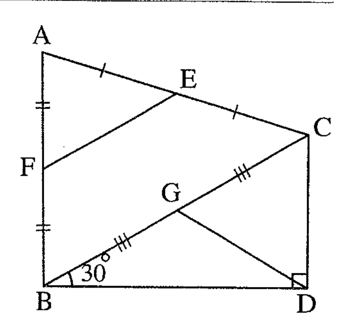
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5 **In the opposite figure :**

F , E , G are the midpoints of $\overline{AB}$, $\overline{AC}$, $\overline{BC}$

, m (∠ BDC) = 90° , m (∠ CBD) = 30°

, BC = 10 cm.



1 **Prove that :** FE = DC = GD

2 **Find :** The perimeter of Δ GCD

11 El-Dakahlia Governorate

Talkha Educational Directorate
A.M.D.L School



Answer the following questions :

1 **Choose the correct answer from the given ones :**

1 The numbers 4 , X + 4 , 8 can be lengths of sides of an isosceles triangle if X = ...

(a) 4 (b) 0 (c) 3 (d) 8

2 In Δ LMN , if m (∠ M) = 55° , m (∠ N) = 80° , then LM .... MN

(a) < (b) > (c) = (d) twice

3 The measure of the exterior angle of the equilateral triangle equals ....

(a) 30° (b) 60° (c) 90° (d) 120°

4 If $\overline{AD}$ is a median of Δ ABC , and M is the point of concurrence of the medians , then AD = ... AM

(a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{2}$

5 The base angles of the isosceles triangle are ....

(a) alternate (b) corresponding (c) congruent (d) supplementary

6 If XA = XB , YA = YB , then $\overleftrightarrow{XY}$ .... $\overline{AB}$

(a) ⊥ (b) ≡ (c) // (d) =



2 **Complete the following :**

1. The number of axes of symmetry of the isosceles triangle is ....
2. The bisector of the vertex angle of the isosceles triangle ....
3. The medians of the triangle intersect at ....
4. The longest side in the right-angled triangle is the ....
5. In Δ ABC , if AB = AC , m ($\angle$ C) = 40° , then m ($\angle$ A) = ...°

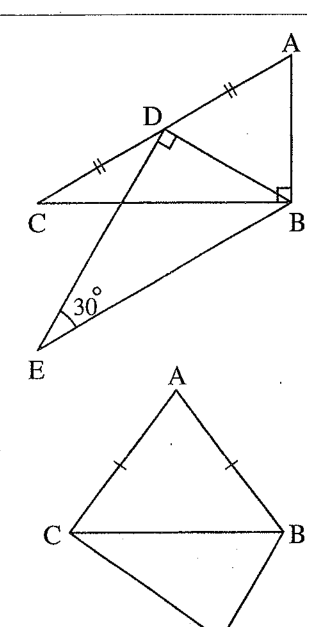
3 [a] **In the opposite figure :**

m ($\angle$ ABC) = m ($\angle$ BDE) = 90°

, m ($\angle$ E) = 30°

, D is the midpoint of $\overline{AC}$

Prove that : AC = BE



[b] **In the opposite figure :**

AB = AC , DC > DB

Prove that :

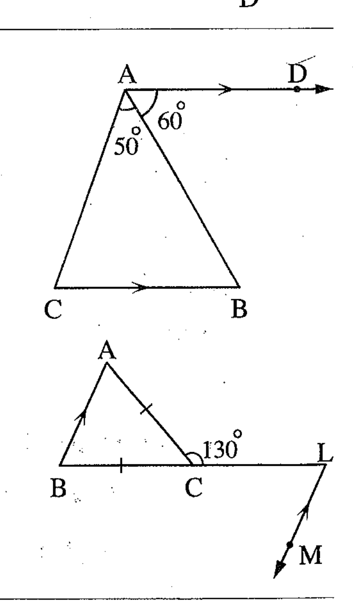
m ($\angle$ ABD) > m ($\angle$ ACD)

4 [a] **In the opposite figure :**

ABC is a triangle , $\overrightarrow{AD}$ // $\overline{CB}$

, m ($\angle$ DAB) = 60° , m ($\angle$ BAC) = 50°

Prove that : AB > AC



[b] **In the opposite figure :**

C $\in$ $\overleftrightarrow{LB}$, AC = BC

, m ($\angle$ LCA) = 130°

, $\overleftrightarrow{LM}$ // $\overleftrightarrow{AB}$

Find : m ($\angle$ MLC)

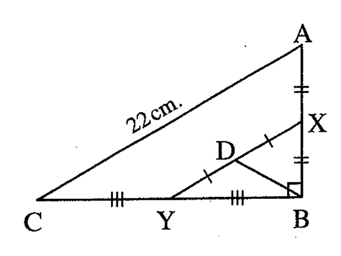
5 [a] **In the opposite figure :**

m ($\angle$ ABC) = 90° , X , Y , D

are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{XY}$

respectively , if AC = 22 cm.

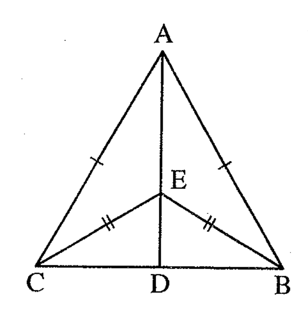
, **find :** BD



[b] In the opposite figure :

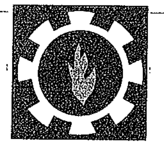
AB = AC , EB = EC

Prove that : BD = CD



12 Suez Governorate

Directorate of Education
Inspection of Mathematics



Answer the following questions :

1 Complete :

1. The base angles in an isosceles triangle are ....
2. If the angles of a triangle are congruent , then the triangle is ....
3. In Δ ABC , if m ($\angle$ A) = 70° , m ($\angle$ B) = 50° , then the longest side is ....
4. The point of concurrence of the medians of the triangle divides each median in the ratio of .... : .... from its vertex.
5. In Δ ABC , if m ($\angle$ A) = 30° and m ($\angle$ B) = 90° , then AC = ... BC

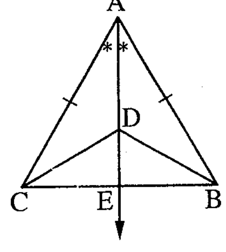
2 Choose the correct answer :

1. The triangle which has three axes of symmetry is ....
   (a) scalene. (b) isosceles. (c) right-angled. (d) equilateral.
2. If the lengths of two sides in an isosceles triangle are 3 cm. and 7 cm.
   , then the length of the third side equals .... cm.
   (a) 3 (b) 4 (c) 6 (d) 7
3. XYZ is a triangle in which m ($\angle$ Z) = 70° and m ($\angle$ Y) = 60°
   , then YZ .... XY
   (a) $>$ (b) $<$ (c) = (d) twice
4. **In the opposite figure :**
   CA = CB , m ($\angle$ B) = x°
   , m ($\angle$ ACD) = 100° where C $\in \overline{BD}$
   , then x = ...
   (a) 50° (b) 100° (c) 150° (d) 200°
5. In Δ ABC , if AB = AC and $\overline{AD}$ is a median , then $\overline{AD}$ .... $\overline{BC}$
   (a) $\equiv$ (b) $\perp$ (c) $\subset$ (d) //
6. In Δ ABC , if AB = 3 cm. , BC = 5 cm. , then AC $\in$ ....
   (a)]2 , 8[(b)]2 , 7[(c)]2 , 15[(d)]8 , 15[



3 [a] ABC is a triangle in which m (∠ A) = 40° , m (∠ B) = 75° Arrange the lengths of sides of the triangle descendingly.

[b] In the opposite figure :

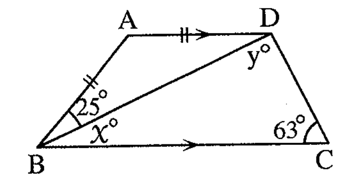


AB = AC , $\overrightarrow{AE}$ bisects ∠ BAC

, $\overline{AE} \cap \overline{BC} = \{E\}$, D ∈ $\overline{AE}$

Prove that : BD = CD

4 [a] **In the opposite figure :**



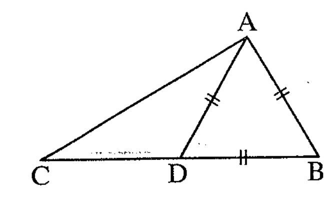
$\overline{AD}$ // $\overline{BC}$, AD = AB

, m (∠ ABD) = 25° , m (∠ C) = 63°

, m (∠ DBC) = x° , m (∠ CDB) = y°

Find the value of each of : x and y

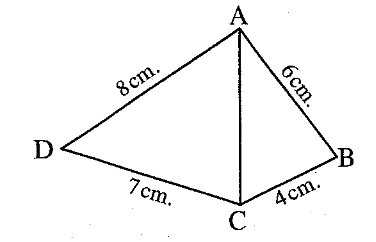
[b] In the opposite figure :



AB = BD = DA

Prove that : BC > AC

5 [a] **In the opposite figure :**



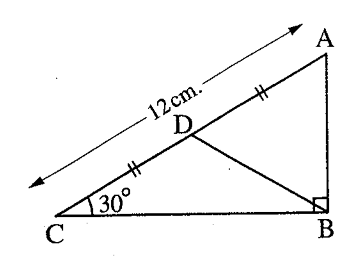
ABCD is a quadrilateral

, AB = 6 cm. , BC = 4 cm.

, CD = 7 cm. , AD = 8 cm.

Prove that : m (∠ BCD) > m (∠ BAD)

[b] In the opposite figure :



ABC is a triangle , m (∠ ABC) = 90°

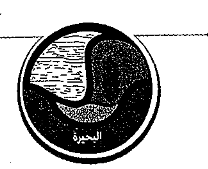
, D is the midpoint of $\overline{AC}$

, AC = 12 cm. , m (∠ C) = 30°

, **then find :** The perimeter of Δ ABD

13 El-Beheira Governorate

Damanhur Directorate
Al-Farabi Language School



Answer the following questions :

1 **Complete the following :**

1 The length of the side opposite to the angle of measure 30° in the right-angled triangle equals .... the length of the hypotenuse.



5 The lengths which can be lengths of sides of a triangle are ....

(a) (0 , 3 , 5) (b) (3 , 3 , 5) (c) (3 , 3 , 6) (d) (3 , 3 , 7)

6 Δ XYZ is an isosceles triangle in which m ($\angle$ X) = 100° , then m ($\angle$ Y) = ...

(a) 100° (b) 80° (c) 60° (d) 40°

2 Complete :

1 The sum of measures of the accumulative angles at a point is ....°

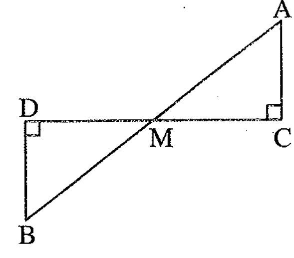
2 The ray drawn from the midpoint of a side of a triangle parallel to another side .... the third side.

3 If the measure of an angle in an isosceles triangle equals 60° , then the triangle is ....

4 The point of concurrence of the medians of the triangle divides each median in the ratio of .... from the base.

5 In Δ ABC , m ($\angle$ B) = 70° , m ($\angle$ C) = 50° , then AC .... AB

3 [a] In the opposite figure :

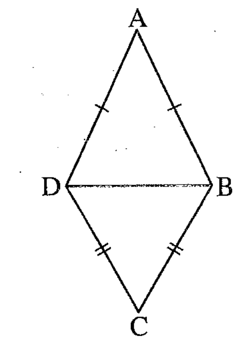


$\overline{AB} \cap \overline{CD} = \{M\}$, $\overline{AC} \perp \overline{CD}$, $\overline{BD} \perp \overline{CD}$

Prove that : AB > CD



[b] In the opposite figure :

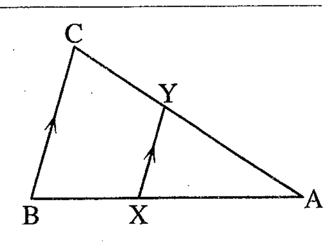


AB = AD , BC = CD

Prove that :

m ($\angle$ ABC) = m ($\angle$ ADC)

4 [a] In the opposite figure :

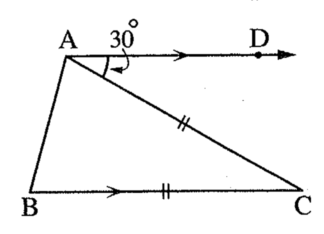


AB > BC , $\overline{XY}$ // $\overline{BC}$

Prove that : AX > XY



[b] In the opposite figure :



ABC is a triangle in which AC = BC , $\overrightarrow{AD}$ // $\overline{BC}$, m ($\angle$ DAC) = 30°

Find with proof :

The measures of the angles of Δ ABC



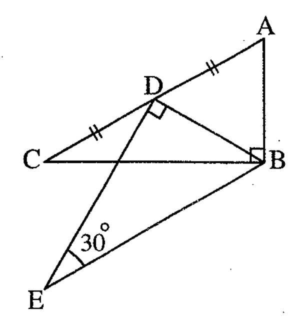
5 **[a] In the opposite figure :**

m (∠ ABC) = m (∠ BDE) = 90°

, m (∠ E) = 30°

, D is the midpoint of $\overline{AC}$

Prove that : AC = BE



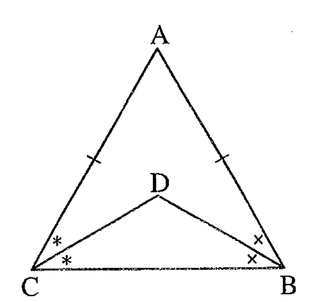
[b] In the opposite figure :

AB = AC , $\overrightarrow{BD}$ bisects ∠ ABC

and $\overrightarrow{CD}$ bisects ∠ ACB

Prove that :

Δ DBC is isosceles.



15 Qena Governorate

Qena Directorate of Education
Math's Supervision



Answer the following questions :

1 **Complete each of the following :**

1. The number of axes of symmetry of the equilateral triangle equals ....
2. In the triangle ABC , if AC = BC and m (∠ C) = 80° , then m (∠ A) = ...°
3. XYZ is a triangle , m (∠ X) = 60° , m (∠ Y) = 40° , then XZ .... ZY
4. The point of intersection of the medians of the triangle divides each of them with the ratio of .... from the vertex.
5. The perpendicular bisector of a line segment is called ....

2 **Choose the correct answer from those given :**

1. The lengths 9 cm. , 4 cm. and .... may be the side lengths of an isosceles triangle.

   (a) 9 cm. (b) 13 cm. (c) 5 cm. (d) 4 cm.

2. $\overline{AD}$ is a median of Δ ABC , and M is the point of concurrence of the medians , then AM = ... AD

   (a) $\frac{2}{3}$ (b) $\frac{1}{2}$ (c) $\frac{3}{2}$ (d) 2

3. The measure of the exterior angle of an equilateral triangle equals ....

   (a) 30° (b) 60° (c) 120° (d) 90°



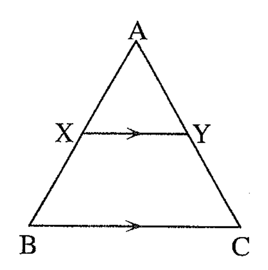
4 In the triangle ABC , if m (∠ B) = 90° , then the greatest side in length is ....

(a) $\overline{AB}$ (b) $\overline{AC}$ (c) $\overline{CB}$ (d) $\overline{XY}$

5 In Δ XYZ , if XY > ZX , then m (∠ Y) .... m (∠ Z)

(a) > (b) < (c) = (d) ≡

3 **[a] In the opposite figure :**



ABC is a triangle in which AB = AC

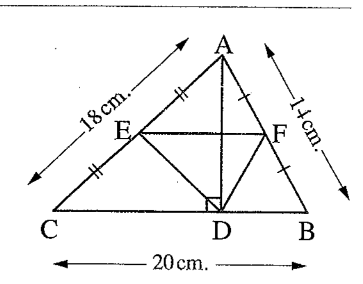
, $\overline{XY}$ // $\overline{BC}$

Prove that :

Δ AXY is an isosceles triangle.

[b] In Δ ABC , m (∠ A) = 40° , m (∠ B) = 75° Arrange the lengths of sides of Δ ABC in an ascending order.

4 **[a] In the opposite figure :**



ABC is a triangle in which AB = 14 cm.

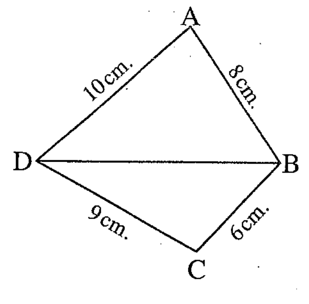
, AC = 18 cm. , BC = 20 cm.

, E is the midpoint of $\overline{AC}$

, F is the midpoint of $\overline{AB}$, and $\overline{AD} \perp \overline{BC}$

Find : The perimeter of Δ DEF

[b] In the opposite figure :



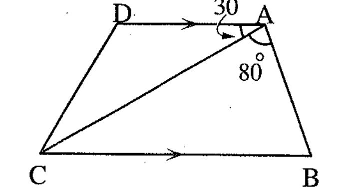
ABCD is a quadrilateral in which AB = 8 cm.

, BC = 6 cm. , CD = 9 cm.

and DA = 10 cm.

Prove that : m (∠ ABC) > m (∠ ADC)

5 **[a] In the opposite figure :**



$\overline{AD}$ // $\overline{BC}$, m (∠ BAC) = 80°

, m (∠ DAC) = 30°

Prove that : BC > AB

[b] Complete : In Δ ABC , if AB = 7 cm. , AC = 5 cm. , then .... < BC < ....